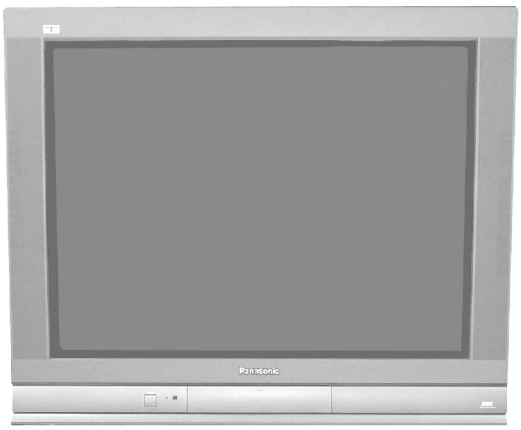
MTNC030729C1
B05

Service Manual

Color Television

CT-36SL13G / CT-32SL13G / CT-36SC13G / CT-32SC13G / CT -3653G

NA10FL



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1. Safety precautions

General guidelines

An isolation transformer should always be used during the servicing of a receiver whose chassis is not isolated from AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injuryfrom electrical shocks. It will also protect the receiver from being damaged by accidental shorting that may occur during servicing. When servicing, observe the original lead dress, especially in the high voltage circuit. Replace all damaged parts (also parts that show signs of overheating.)

Always replace protective devices, such as fish paper, isolation resistors and capacitors, and shields after servicing the receiver. Use only manufacturer's recommended rating for fuses, circuits breakers, etc.

High potentials are present when this receiver is operating. Operation of the receiver without the rear cover introduces danger for electrical shock. Servicing should not be performed by anyone who is not thoroughly familiar with the necessary precautionswhen servicing high voltage equipment.

Extreme care should be practiced when handling the picture tube. Rough handling may cause it to implode due to atmospheric pressure. (14.7 lbs per sq. in.). Do not nick or scratch the glass or subject it to any undue pressure. When handling, usesafety goggles and heavy gloves for protection. Discharge the picture tube by shorting the anode to chassis ground (not to the cabinet or to other mounting hardware). When discharging connect cold ground (i.e. dag ground lead) to the anode with a wellinsulated wire or use a grounding probe.Avoid prolonged exposure at close range to unshielded areas of the picture tube to prevent exposure to x ray radiation.

The test picture tube used for servicing the chassis at the bench should incorporate safety glass and magnetic shielding. The safety glass provide shielding for the tube viewing area against x ray radiation as well as implosion. The magnetic shieldlimits the x ray radiation around the bell of the picture tube in addition to the restricting magnetic effects. When using a picture tube test jig for service, ensure that the jig is capable of handling 50kV without causing x ray radiation.

Before returning a serviced receiver to the owner, the service technician must thoroughly test the unit to ensure that is completely safe to operate. Do not use a line isolation transformer when testing.

Leakage current cold check

Unplug the A.C. cord and connect a jumper between the two plug prongs.Measure the resistance between the jumpered AC plug and expose metallic parts such as screwheads, antenna terminals, control shafts, etc. If the exposed metallic part has a returnpath to the chassis, the reading should be between 240k Ω and 5.2M Ω . If the exposed metallic part does not have a return path to the chassis, the reading should be infinite.

Leakage current hot check

Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

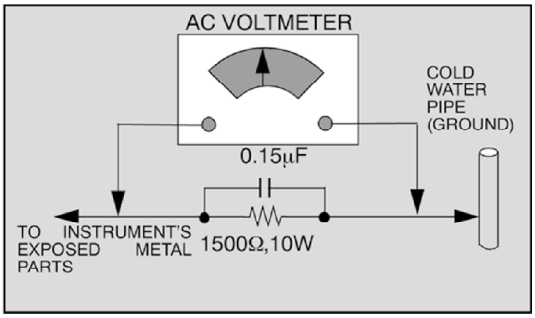
Connect a 1.5k Ω 10 watt resistor in parallel with a 0.15 μ F capacitor between an exposed metallic part and ground. Use earth ground, for example a water pipe.

Using a DVM with a 1000 ohms/volt sensitivity or higher, measure the AC potential across the resistor.

Repeat the procedure and measure the voltage present with all other exposed metallic parts. Verify that any potential does not exceed 0.75 volt RMS. A leakage current tester (such a Simpson model 229, Sencore model PR57 or equivalent) may be used in the above procedure, in

which case any current measure must not exceed 0.5 milliamp. Ifany measurement is out of the specified limits, there is a possibility of a shock hazard and the receiver must be repaired and rechecked before it is returned to the customer.

Hot check circuit



Insulation test

Connect an insulation tester between an exposed metallic part and A.C. line. Apply 1080VAC/ 60Hz for 1 second. Confirm that the current measurement is 0.5mA ~ 2.0mA. Repeat test with other metallic exposed parts.

X ray radiation

WARNING
The potential source of x ray radiation in the TV set is in the high voltage section and the picture tube.

NOTE
It is important to use an accurate, calibrated high voltage meter.

Set the brightness, picture, sharpness and color controls to minimum.
Measure the high voltage. The high voltage should be 33.0 ± 1.0kV. If the upper limit is out of tolerance, immediate service and correction is required to insure safe operation and to prevent the possibility of prematurecomponent failure.

Horizontal oscillator disable circuit test

This test must be performed as a final check before the receiver is returned to the customer. See horizontal oscillator disable circuit procedure check in this manual.

2. Service notes

NOTE
These components are affixed with glue. Be careful not to break or damage any foil under the component or at the pins of the ICs when removing. Usually applying heat to the component for a short time while twisting with tweezers will break the componentloose.

Leadless chip component (surface mount)

Chip components must be replaced with identical chips due to critical foil track spacing. There are no holes in the board to mount standard transistors or diodes. Some chips capacitor or resistor board solder pads may have holes through the board,however the hole diameter limits standard resistor replacement to 1/8 watt. Standard capacitor may also be limited for the same reason. It is recommended that identical components be used.

Chip resistor have a three digit numerical resistance code, 1st and 2nd significant digits and a multiplier. Example: 162 = 1600 or 1.6k Ω resistor, 0 = 0 Ω (jumper).

Chip capacitors generally do not have the value indicated on the capacitor. The color of the component indicates the general range of the capacitance.

Chip transistors are identified by a two letter code. The first letter indicates the type and the second letter, the grade of transistor.

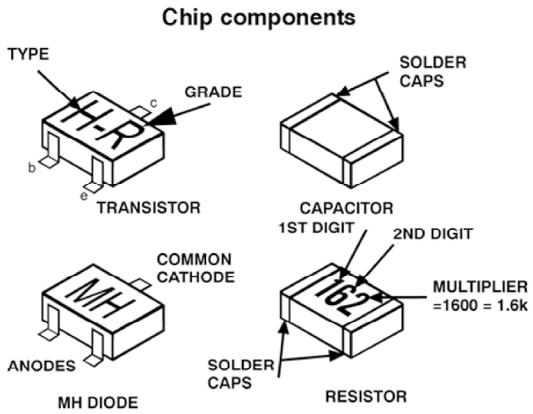
Chip diodes have a two letter identification code as per the code chart and are a dual diode pack with either common anode or common cathode. Check the parts list for correct diode number.

Component removal

1. **Use solder wick to remove solder from component end caps or terminal.**
2. **Without pulling up, carefully twist the component with tweezers to break the adhesive.**
3. **Do not reuse removed leadless or chip components since they are subject to stress fracture during removal.**

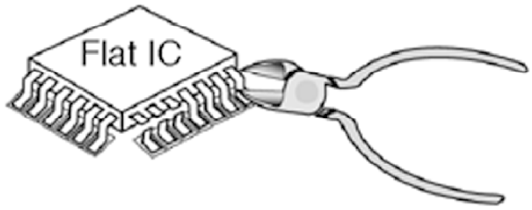
Chip component installation

1. **Put a small amount of solder on the board soldering pads.**
2. **Hold the chip component against the soldering pads with tweezers or with a miniature alligator clip and apply heat to the pad area with a 30 watt iron until solder flows. Do not apply heat for more than 3 seconds.**

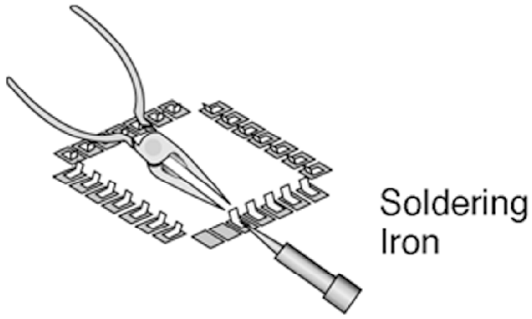


How to replace flat ic (required tools)

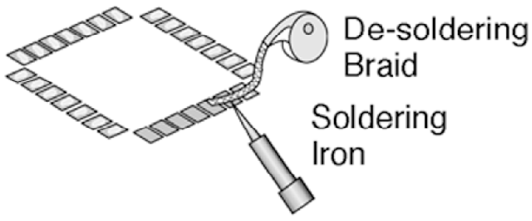
1. **Remove the solder from all of the pins of a Flat IC by using a desolder braid**



2. **Put the iron wire under the pins of the Flat IC and pull it in the direction indicated while heating the pins using a soldering iron. A small awl can be used instead of the iron wire.**

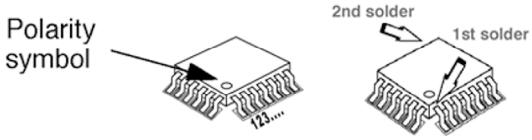


3. **Remove the solder from all the pads of the Flat IC by using a de solder braid**



4. **Position the new Flat IC in place (apply the pins of the Flat IC to**

the soldering pads where the pins need to be soldered). Properly determine the positions of the soldering pads and pins by correctly aligning the polarity symbol



5. **Solder all pins to the soldering pads using a fine tipped soldering iron**

6. **Check with a magnifier for solder bridge between the pins or for dry joint between pins and soldering pads. To remove a solder bridge, use a de solder braid as shown in the figure below**

IMPORTANT

To protect against possible damage to the solid state devices due to arching or static discharge, make certain that all ground wires and CRT DAG wire are securely connected.

CAUTION

The power supply circuit is above earth ground and the chassis cannot be polarized. Use an isolation transformer when servicing the receiver to avoid damage to the test equipment or to the chassis. Connect the test equipment to the proper ground(hot) or (cold) when servicing, or incorrect voltages will be measured.

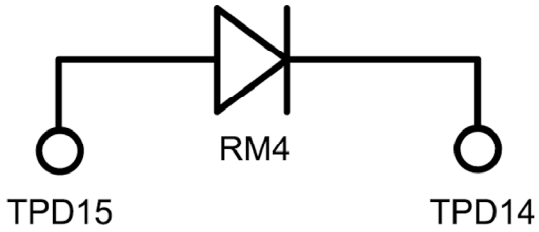
2.1. X-Ray Protection Circuit Check& Adjustments

This test must be performed as final check before the receiver is returned to the customer. If voltages are out of tolerance, immediate service and correction is required to insure safe operation and to prevent the possibility of premature componentfailure.

Equipment:

1. **Isolation transformer.**
2. **High voltage meter.**
3. **D.C. Ammeter**
4. **Short jumper.**
5. **HHS jig (See figure below).**

Diode Connection Jumper.



Preparation:

1. **Make sure the receiver is turned off.**
2. **Connect the receiver to an isolation transformer.**
3. **Connect the ammeter serial from the flyback anode lead to the picture tube anode socket.**
4. **Prepare short jumper and HHS jig.**

Procedure:

1. **Connect the short jumper between TPD16 & TPD17.**
2. **Connect the jumper diode between TPD14 and TPD15 (anode connected to TPD15 and cathode to TPD14).**
3. **Apply 75VAC to AC input of isolation transformer.**
4. **Turn the receiver on.**
5. **Apply a monoscope pattern.**
6. **Set customer picture and brightness controls to the minimum.**
7. **tSet current within 50 μ A to 100 μ A by changing the picture and bright controls.**

8. **Slowly increase AC voltage at the input of the isolation transformer and confirm HHS voltage measure 36kV.**
9. **Turn power off and remove jigs.**

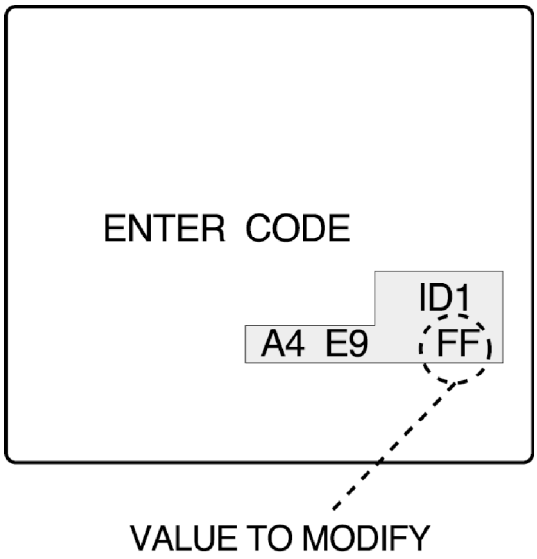
3. EEPROM replacement

If a new EEPROM integrated circuit is replaced for servicing, follow the next procedure once that the memory is properly assembled:

1. **Turn the TV set ON.**
2. **Enter to service mode.**
3. **Once inside service mode the first image that appears on-screen is the ID1 register with the respective address value (FF) like the image below.**

   Note:

   All 3 registers (ID1,ID2,ID3) should appear with FF values if a new EEPROM is assembled.



4. **With "VOL" keys adjust the correct value according with the service adjustment table (see "Service Mode" section in page 15).**
5. **Change to the next ID switch register with "CH" keys and repeat the same procedure as step 4.**
6. **When replacing a new EEPROM be sure to set the correct ID switch values for each model.**
7. **Once that all 3 registers are set with the correct address value,**

perform all of the remaining adjustments and servicing.

IMPORTANT:

Correct ID switch configuration should be input when replacing EEPROM for each television model, otherwise if wrong values are configured, the television software will not function accordingly and properly.

4. About lead free solder (PbF)

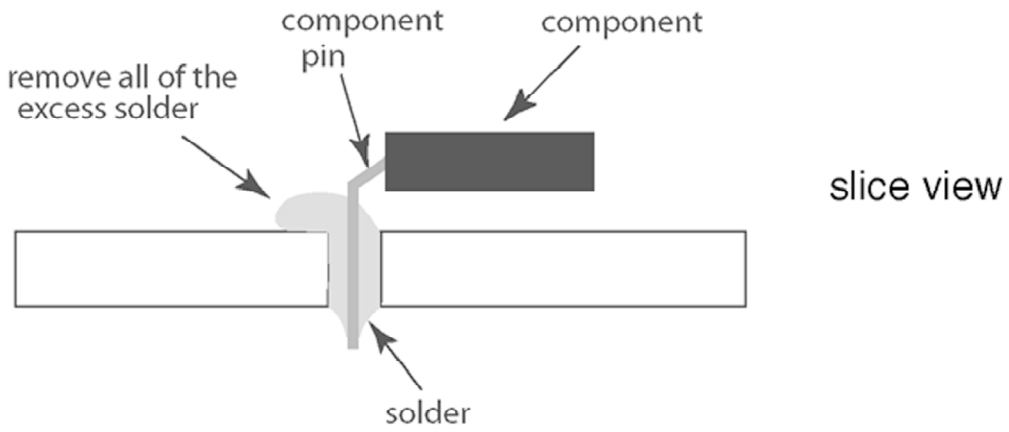
NOTE

Lead is listed as (Pb) in the periodic table of elements. / In the information below, Pb will refer to lead solder, and PbF will refer to Lead Free Solder. / The lead free solder used in our manufacturing process and discussed below is (Sn+Ag+Cu). / Thatis Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

This model uses Pb Free solder in it's manufacture due to environmental conservation issues. For / service and repair work, we'd suggest the use of Pb free solder as well, although Pb solder may be / used. / PCBs manufacturedusing lead free solder will have the "PbF" or a leaf symbol stamped on the / back of PCB.

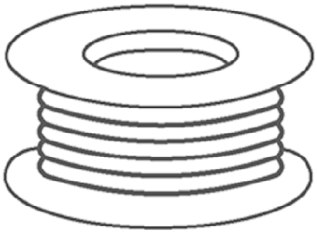
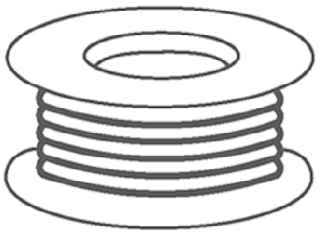
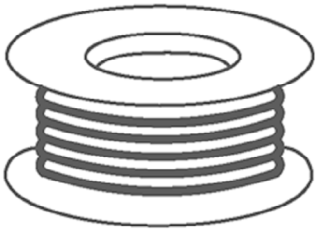
CAUTION

- **Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30 ~ 40 °C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).**
- **Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C). / If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If thisis not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.**
- **After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side.**



Suggested Pb free solder

There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder can also beused.

0.3mm X 100g	0.6mm X 100g	1.0mm X 100g
		

5. Receiver feature table

FEATURE/MODEL	CT-32SL13G	CT-36SL13G
CHASSIS	AP411	AP412
MICRO	128K	
MENU LANGUAGE	ENG/SPAN/FR	
CLOSED CAPTION	X	
V-CHIP (USA/CANADA)	X	
CHANNEL COUNT	181	
CHANNEL INFO BANNER	X	
VIDEO INPUT SKIP	X	
75 OHM INPUT	X	
REMOTE CONTROL	EUR7613Z60	
CRT SUPPLIER	MDDA FLAT (4:3)	
CHASSIS	NA10FL	
COMB FILTER	MOTION ADP 3 DIG	
HEC/VEC (X=BOTH)	X	
VM	X (DIGITAL)	
V/A NORM (X=BOTH)	X	
COLOR TEMP	X	
PRESET/INPUT LABELING	X	
VIDEO PICTURE MEMORY	X	
MTS/SAP/DBX	X	
BUILT-IN AUDIO POWER	10Wx2	
No. OF SPEAKERS	2	
BASS/BALANCE/TREBLE CONTROL	X	
AI SOUND	X	
SURROUND	X	
SPATIALIZER/BBE	BBE	
A/V IN (REAR/FRONT)	3(2/1)	
A/V PROGRAM OUT	X	
AUDIO OUT (FAO:F, VAO:V)	F, V	
COMPONENT INPUT (Y, Pb, Pr)	1	
S-VIDEO INPUT (REAR/FRONT)	1/1	
EPJ/HPJ/MISC	HPJ	

FEATURE/MODEL	CT-32SC13G	CT-36SC13G
CHASSIS	BP411	BP412
MICRO	128K	
MENU LANGUAGE	ENG/SPAN/FR	
CLOSED CAPTION	X	
V-CHIP (USA/CANADA)	X	
CHANNEL COUNT	181	
VIDEO INPUT SKIP	X	
75 OHM INPUT	X	
75 OHM INPUT	X	
REMOTE CONTROL	EUR7613Z60	
CRT SUPPLIER	MDDA FLAT (4:3)	
CHASSIS	NA10FL	
COMB FILTER	3-LINE	
HEC/VEC (X=BOTH)	X	
VM	X (DIGITAL)	
V/A NORM (X=BOTH)	X	
COLOR TEMP	X	
PRESET/INPUT LABELING	X	
VIDEO PICTURE MEMORY	X	
MTS/SAP/DBX	X	
BUILT-IN AUDIO POWER	5Wx2	
No. OF SPEAKERS	2 (DOME)	
BASS/BALANCE/TREBLE CONTROL	X	
AI SOUND	X	
SURROUND	X	
SPATIALIZER/BBE	BBE	
A/V IN (REAR/FRONT)	3(2/1)	
A/V PROGRAM OUT	X	
AUDIO OUT (FAO:F, VAO:V)	F, V	
COMPONENT INPUT (Y, Pb, Pr)	1	
S-VIDEO INPUT (REAR/FRONT)	1/1	
EPJ/HPJ/MISC	HPJ	

FEATURE/MODEL	CT-3653G
CHASSIS	BP412
MICRO	128K
MENU LANGUAGE	ENG/SPAN/FR
CLOSED CAPTION	X
V-CHIP (USA/CANADA)	X
CHANNEL COUNT	181
VIDEO INPUT SKIP	X
75 OHM INPUT	X
75 OHM INPUT	X
REMOTE CONTROL	EUR7613Z60
EXTRA REMOTE CONTROL	EUR7713010
CRT SUPPLIER	MDDA FLAT (4:3)
CHASSIS	NA10FL
COMB FILTER	3-LINE
HEC/VEC (X=BOTH)	X
VM	X (DIGITAL)
V/A NORM (X=BOTH)	X
COLOR TEMP	X
PRESET/INPUT LABELING	X
VIDEO PICTURE MEMORY	X
MTS/SAP/DBX	X
BUILT-IN AUDIO POWER	7.5Wx2
No. OF SPEAKERS	2 (DOME)
BASS/BALANCE/TREBLE CONTROL	X
AI SOUND	X
SURROUND	X
SPATIALIZER/BBE	BBE
A/V IN (REAR/FRONT)	3(2/1)
A/V PROGRAM OUT	X
AUDIO OUT (FAO:F, VAO:V)	F, V
COMPONENT INPUT (Y, Pb, Pr)	1
S-VIDEO INPUT (REAR/FRONT)	1/1
EPJ/HPJ/MISC	HPJ

Note:
Specifications are subject to change without notice or obligation.

NOTE:
CT-3653G includes EUR7613Z60 remote control and an extra remote control with part number EUR7713010

6. Board description table

CT-32SL13G

BOARD	PART NUMBER	DESCRIPTION
A	TNP2AH052AA	MAIN BOARD
D	TNP2AH053AB	POWER SUPPLY
G	TNP2AA142AB	FRONT A/V BOARD
K	TNP2AA143	KEY BOARD
L	TNPA1673AE	CRT BOARD

CT-36SL13G

BOARD	PART NUMBER	DESCRIPTION
A	TNP2AH052	MAIN BOARD
D	TNP2AH053	POWER SUPPLY
G	TNP2AA142AB	FRONT A/V BOARD
K	TNP2AA143	KEY BOARD
L	TNPA1673AE	CRT BOARD

CT-32SC13G

BOARD	PART NUMBER	DESCRIPTION
A	TNP2AH052AA	MAIN BOARD
D	TNP2AH053AB	POWER SUPPLY
G	TNP2AA141	FRONT A/V BOARD
L	TNPA1673AE	CRT BOARD

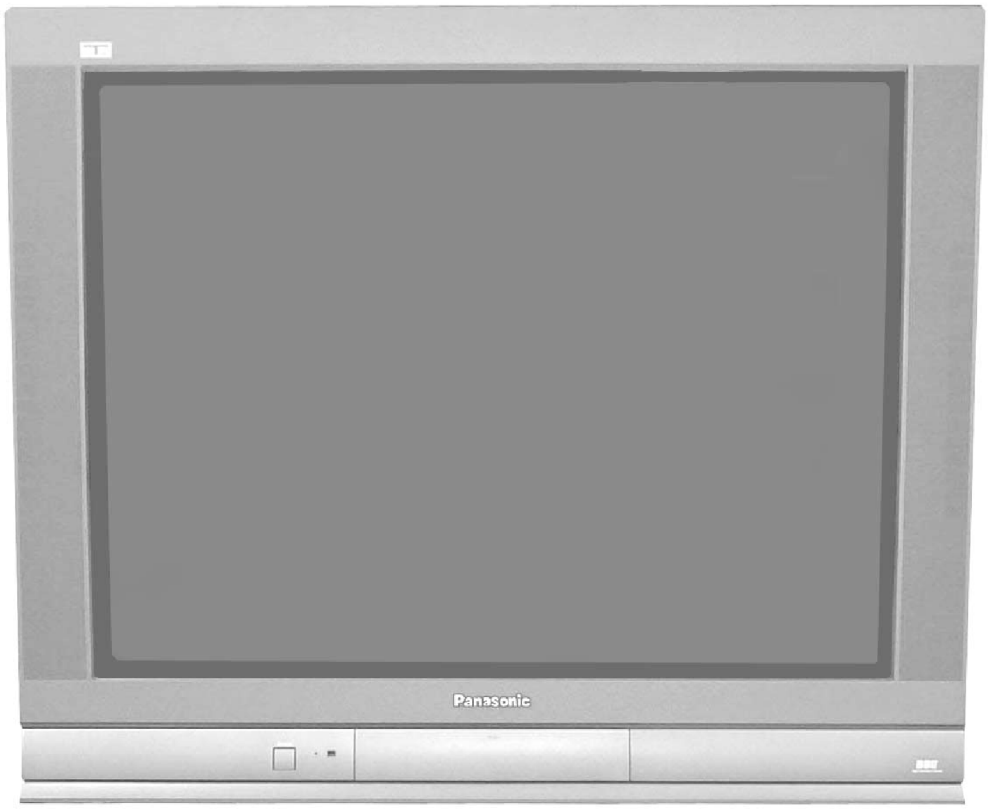
CT-36SC13G and CT-3653G

BOARD	PART NUMBER	DESCRIPTION
A	TNP2AH052	MAIN BOARD
D	TNP2AH053	POWER SUPPLY
G	TNP2AA141	FRONT A/V BOARD
L	TNP1673AE	CRT BOARD

NOTE
When ordering a replacement board assembly, append an “S” to the board number

EXAMPLE
To order the A Board, the replacement board is TNP2AH052AAS.

7. TV Location of controls

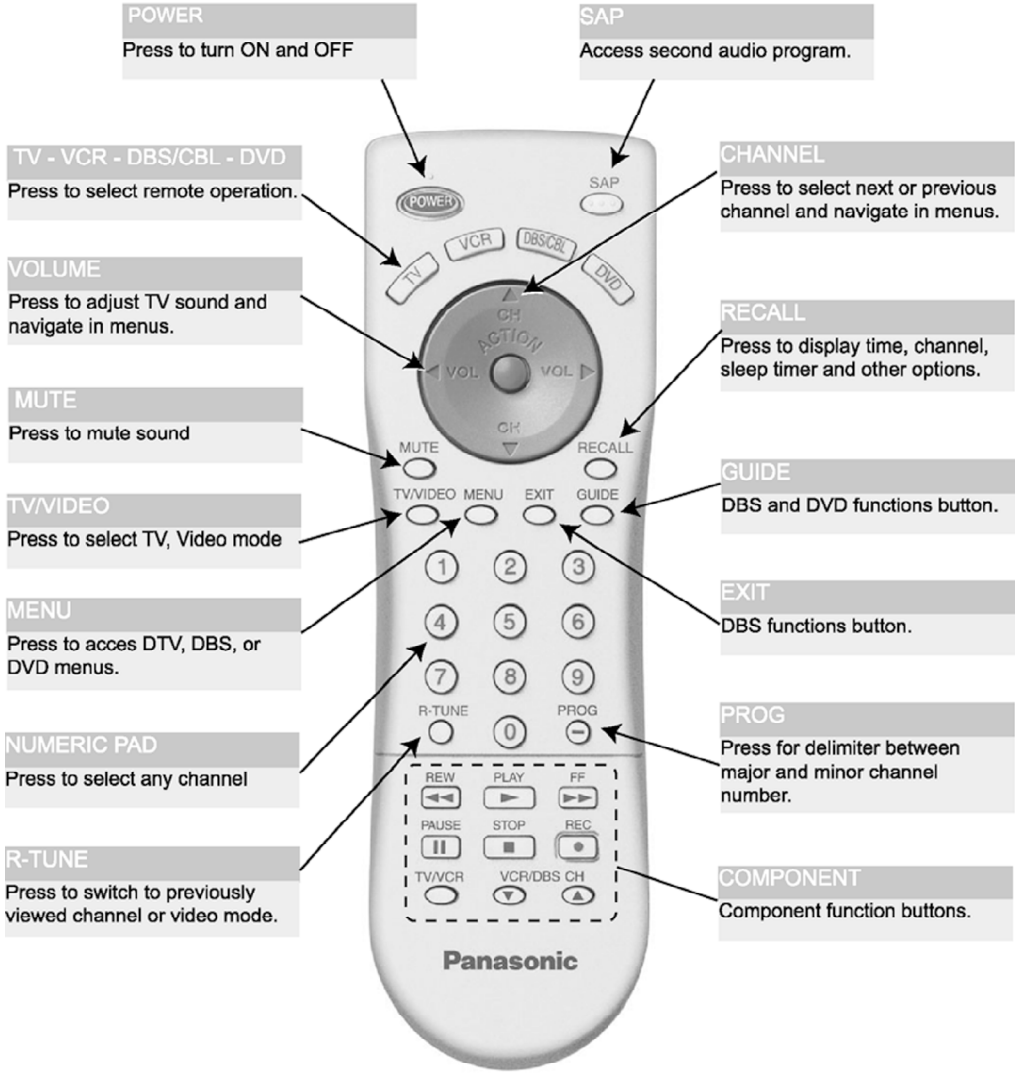


NOTE:
Front cabinet may vary depending on the model

User controls are inside the front door

Quick reference control operation	
1	**Power -** Press to turn ON or OFF.
2	**Volume -** Press to adjust sound level, or to adjust audio menus, video menus, and select operating features when menus are displayed
3	**Channel** - Press to select programmed channels. Press to highlight desired features when menus are displayed. Also use to select cable converter box channels after programming remote control infra-red codes (the TV/AUX/CABLE switch must be set in CABLE position).
4	**Action -** Press to display main menu and access on screen feature and adjustment menus.
5	**TV/Video -** Press to select TV or one of the video inputs, for the main picture or the PIP frame (when PIP frame is displayed).

8. Location of controls (EUR7613Z60 remote)



Note:
For additional information about this remote please refer to the owner's manual section remote operation, listed on the parts list section.

9. Location of controls (EUR7713010 remote)

POWER
Press to turn ON and OFF.

VOL
Press to adjust TV sound and navigate in menus.

MUTE
Press to mute sound.

KEYBOARD
Press to select any channel.

R-TUNE
Press to switch to previously viewed channel or video mode.

SAP
Press to acces the secondary audio program broadcast.

CH
Press to select next or previous channel and navigate in menus.

TV/VIDEO
Press to select TV, Video mode.

RECALL
Press to display time, channel sleep timer and other options.

Note:
For additional information about this remote please refer to the owner's manual section remote operation, listed on the parts list section.

NOTE:
CT-3653G includes EUR7613Z60 remote control and an extra remote control with part number EUR7713010

10. Dissasembly for service

Back cover
Remove all the screws marked with an arrow (←) from the back of the receiver

NOTE
Screw location and quantity may vary depending on the model of the receiver serviced and the application; various models are covered in this manual. Use same hardware when reassembling the receiver.

- 4 screws at the top edge of the receiver.
- 4 screw by the A/V jacks.
- 1 screw by the antenna jacks.
- 1 screw at the lower part of TV.
- 1 screw at each lower corner of the receiver.
- 1 screw by the retainer plate of the AC power cord.
- 1 screw by the A.C. cord assembly.

NOTE
Extensions for board connectors may be needed to take voltages on some boards, please see parts list section for part numbers in this service manual.

A-Board - Main chassis

The A-Board assembly rest on a chassis tray along with the D-Board.
Slide chassis tray out. Gently lift the tray and pull out. Disconnect plug connectors; release wire ties and holders as required for complete chassis removal.

1. **A-Board is secured to the chassis tray with screws.**
2. **The A-Board is mated to the D-Board by three flexible connectors: A5, A6 & A7 (D5, D6 & D7 on the D-Board, respectively). To remove either boards, unplug the connectors on the A-Board.**

NOTE
Some tie-wraps that secure the wire dressings may need to be unfastened for chassis removal

D-Board - Deflection

The D-Board assembly rest on a chassis tray along with the A-Board.
Slide chassis tray out. Gently lift the tray and pull out. Disconnect plug connectors; release wire ties and holders as required for complete chassis removal.

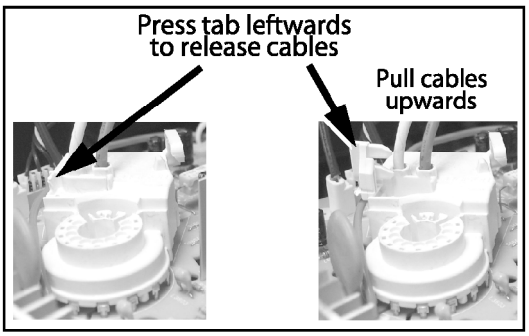
1. **D-Board is secured to the chassis tray with screws.**
2. **The D-Board is mated to the A-Board by three flexible connectors: D5, D6 and D7 (A5, A6 & A7 on the A-Board, respectively). To remove either boards, unplug the connectors on the A-Board.**

NOTE
Some tie-wraps that secure the wire dressings may need to be unfastened for chassis removal

L-Board - CRT output

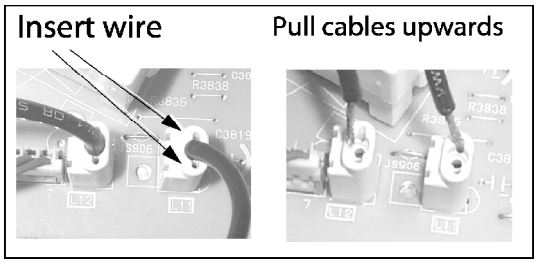
Plugs into the socket on the CRT neck.
To remove this board, first unplug the board from the CRT neck, then disconnect L1, L2 and L3 connectors, to disconnect the focus F1(red cable) & F2 (white cable) cables from the CRT socker, pull the tab and release the cables (see figure),finally disconnect the screen cable from the D-Board D16 (screen and heater).
To reinsert back the cables, remember the original position of cables, F1 (red cable) goes to A on the CRT socket and F2 (white cable) goes to B on the CRT socket.

F1 and F2 cables release



To release screen GND cables from L-Board L11 & L12 connectors, insert a wire in both sides of connector and pull upwards the cable, then remove the wire.

L11 and L12 cables release



G-Board

Mated to A-Board by three flexible connectors A1, A2, A3 and D40 from D-Board. To remove this board, first unplug the four flexible connectors, then RT1 and G4connectors, then pull upwards the board while unlock the tabs from the chassis tray.

Speakers
Each speaker is secured to a plastic base with 4 screws, and each plastic base is secured to the from cabinet with two screws.

NOTE
When reassembling speakers be sure to connect the speaker wires to the correct speaker lead (+) (-)

10.1. Disassembly for CRT replacement

1. **Discharge the CRT as instructed in the “safety precautions” section and remove 2nd anode button from the CRT.**
2. **Remove speaker modules (R and L)**
3. **Perform complete removal of chassis, as instructed in “disassembly for service” section.**

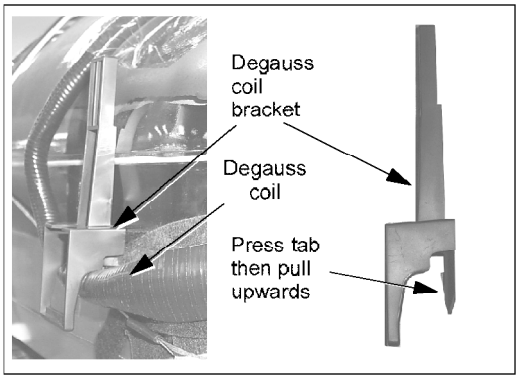
NOTE
When remounting the CRT, reuse the metal sheet located in the lower part of the cabinet holding the CRT, hold with screws to the cabinet. This metal sheet is not supplied with the CRT replacement.

CRT replacement

1. **Perform “disassembly for CRT replacement” procedure.**
2. **Insure that the CRT H.V. Anode button is discharged before handling the CRT. Read the “safety precautions” section on handling the picture tube.**
3. **Remove the components from the CRT neck and place the cabinet face down on a soft pad.**
4. **Note the original order for the CRT mounting hardware as they are remove from the CRT mounting brackets at each corner of the CRT.**
5. **Remove the CRT with the degaussing coil and the dag ground braid attached.**

NOTE
To remove the four brackets holding the degauss coil from the corners of the CRT, first remove the CRT from the cabinet, then remove the brackets by pressing the tab on the bracket and pull upwards. These brackets are included in the degauss coilkit, for part number, please see parts list section

Brackets removal



6. **Note the original locations and mounting of the degaussing coil and the dag ground assembly to insure proper reinstallation on the replacement CRT.**
   To remove and remount the degaussing coil:

   - Unhook the coil spring from the bottom corners of the CRT ears.
   - Release the braid loop from the upper corners of the CRT ears.

7. **Mount the dag ground braid on the replacement CRT. Position the degaussing coil with new ties.**
   Dress coil as was on the original CRT.

8. **Replace the components on CRT neck and reinstall into cabinet. Verify that all ground wires and circuit board plugs get connected.**

NOTE
Reuse all the clampers and mounting brackets from the degauss coil and screen, and when remounting the degauss coil assure that is not touching the speakers, this can be done by placing some tape, this may cause mask vibration. The mounting brackets andclampers are not supplied with the replacements.

IMPORTANT NOTICE
When ordering the CRT, please order CRT and CRT kit also.
Please see parts list section for part numbers.

11. Chassis service adjustment procedures

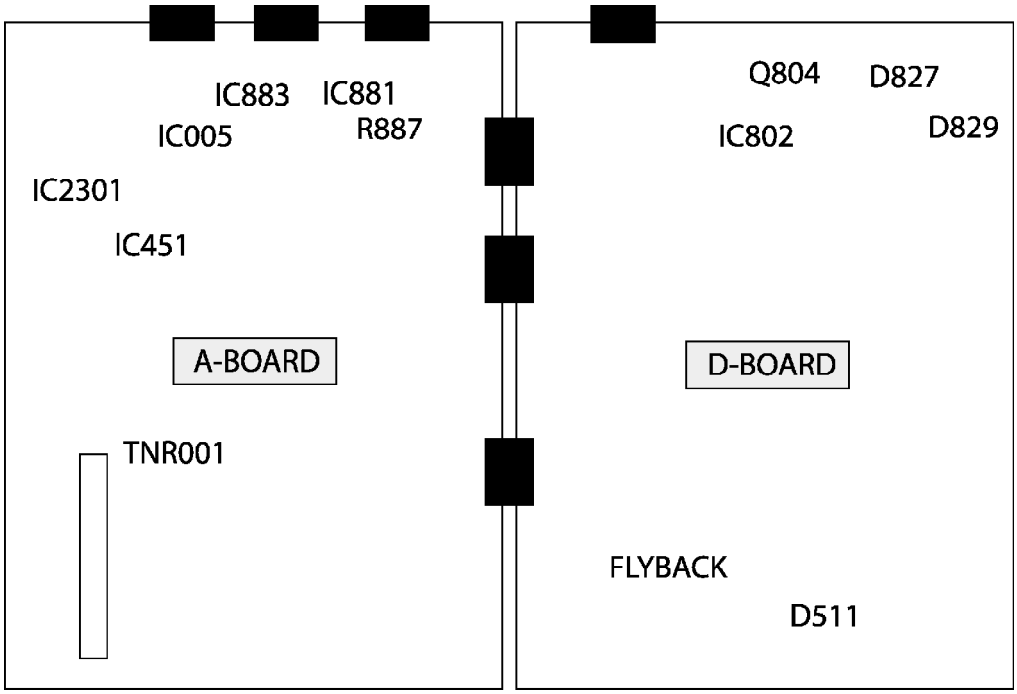
All service adjustments are factory preset and should not require adjustment unless controls and/ or associated components are replaced.

Note:

Connect the (-) lead of the voltmeter to the appropriate ground. Use

IC801's heat sink when the HOT ground symbol is used. Otherwise, use COLD ground (tuner shield, IC451's heat sink or FA2).

Component and Voltage Test Points



Note:

Components and test points within doted areas are located on trace side.

B+ voltage check

1. **Set the BRIGHT and PICTURE to minimum by using the PICTURE menu.**
2. **Connect the DVM between TPD145 and cold ground.**
3. **Confirm that B+ voltage is 144.7 ± 1.5V. This voltage supplies B+ to the horizontal output and flyback circuits.**

Source voltage chart

120V AC line input. Set the BRIGHT and the PICTURE to minimum by using the PICTURE menu. Use cold or hot ground for the (-) lead of the DVM as needed.

D-BOARD	LOCATION	TEST POINT	VOLTAGE
+B2	by IC802	TPD145	144.7 ± 1.5V
9V	by Q804	TPD9	8.2 ± 1.5V
15V	by D827	TPD14	14.6 ± 2.0 V
15V (VER)	by D827	TPD15	15.0 ± 1.5 V
+15V (VER)	by D827	TPD17	-14.9 ± 1.5V
SOUND	by D829	TPD30	31.8 ± 2.0V
220V	by D511	TPD7	210.0 ± 9.0V

A-BOARD	LOCATION	TEST POINT	VOLTAGE
MAIN 12V	by IC883	TPA6	12.0 ± 0.5V
MAIN 9V	by R887	TPA7	9.0 ± 0.5V
MAIN 5V	by IC881	TPA8	5.0 ± 0.3V
STBY 3.3V	by IC005	TPA16	3.3 ± 0.2V
BTL 30V	by TNR002	TPA18	30.0 ± 2.0V

High voltage check

1. **Select an active TV channel and confirm that horizontal is in sync.**
2. **Adjust BRIGHTNESS and CONTRAST using PICTURE icon menu so video just disappears.**
3. **Using a high voltage meter confirm that the high voltage is 33.0 ± 1.0kV.**

12. Purity and convergence procedure

Adjustment is necessary only if the CRT or the deflection yoke is replaced or if the setting was disturbed. The complete procedure consists of:

1. **Vertical raster shift adjustment.**
2. **Initial static convergence.**
3. **Setting the purity.**
4. **Final static convergence.**

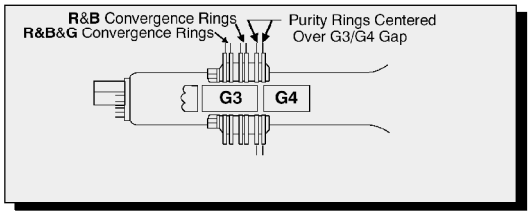
WHEN THE CRT OR THE YOKE IS REPLACED

For 2 piece assembly:

Position purity/convergence assembly as shown and tighten clamp snugly. Remove the hot-melt glue seal on assembly and position like tabs of purity device together at 12 o' clock to reduce its

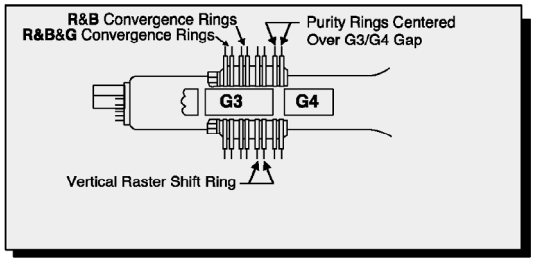
magnetic field effect.

2 piece assembly

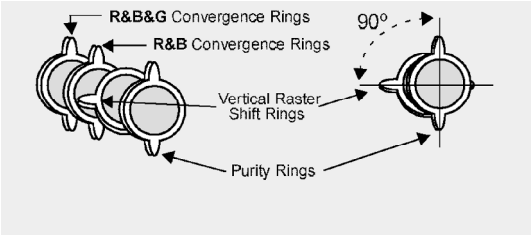


For models using 4 pairs of rings, place the yoke on the CRT neck (do not tighten the clamp). Place the vertical raster shift tabs at 3 o'clock (90° from the purity and convergence tabs.

Description of rings



Initial position of rings



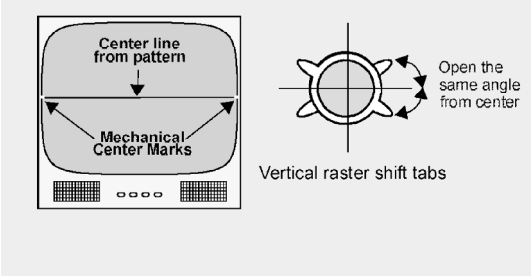
Turn the receiver ON. Operate the receiver for 60 minutes using the first purity check field (white screen) to stabilize the CRT.
Fully degauss the receiver by using an external degaussing coil.
Slide the deflection yoke back and forth on the neck of the CRT until it produces a near white, uniform raster.

VERTICAL RASTER SHIFT ADJUSTMENT

Apply a green pattern with a horizontal line, adjust the Deflection Yoke so that has no tilt, then secure it.
Adjust center line of the pattern with the mechanical center of the CRT, this center is determined by two marks at the side edges of the screen. To adjust the line, once the vertical raster shift tabs are place at 3 o'clock to reduce itsmagnetic field effect open the tabs the same angle from the center, until the center line of the pattern becomes a straight line, centered with the marks of the CRT.

IMPORTANT NOTICE
Rings come along with deflection yoke in one piece.

Vertical raster shift adjustment



INITIAL CENTER STATIC CONVERGENCE

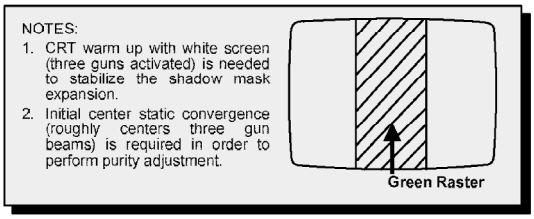
Connect a dot/cross hatch generator to the receiver and tune in a signal. Observe misconvergence at center of the screen only.
Adjust the R&B pole magnets; by separating tabs and rotating to converge blue with red.
Adjust the R&B and R&B&G pole magnets: by separating tabs and rotating to converge blue and red (magenta) with green.

NOTE
Precise convergence at this point is not important.

PURITY ADJUSTMENT

When the receiver is in the serviceman mode for making electronic adjustments, press the RECALL button on the remote control to enter purity check. (See the service adjustments electronic controls procedure).
Operate the receiver for 60 minutes using the first purity check field (white screen) to stabilize the CRT.
Fully degauss the receiver by using an external degaussing coil.
Press the RECALL button on the remote control again until the purity check (green screen) appears.
Loosen the deflection yoke clamp screw and move the deflection yoke back as close to the purity magnet as possible.
Adjust the purity rings to set the vertical green raster precisely at the center of the screen.

Green raster adjustment


NOTES:
1. CRT warm up with white screen (three guns activated) is needed to stabilize the shadow mask expansion.
2. Initial center static convergence (roughly centers three gun beams) is required in order to perform purity adjustment.
Green Raster

Slowly move the deflection yoke forward until the best overall green screen is displayed.
Tighten the deflection yoke clamp screw.
Press the RECALL button on the remote control again until the purity check blue and red screens appear and observe that good purity is obtained on each respective field.
Press the RECALL button on the remote control again until purity check (white screen) appears.
Observe the screen for uniform white. If purity has not been achieved, repeat the above

procedure.

FINAL CONVERGENCE PROCEDURE

NOTE
Vertical size and focus adjustments must be completed prior to performing the convergence adjustment. Connect a dot pattern generator to the receiver. The brightness level should not be higher than necessary to obtain a clear pattern.

Converge the red and the blue dots at the center of the screen by rotating the R&B pole static convergence magnets.
Align the converged red/blue dots with the green dots at the center of the screen by rotating the R &B&G pole static convergence magnets. Melt wax with soldering iron to reseal the magnets.
Slightly tilt vertically and horizontally (do not rotate) the deflection yoke to obtain a good overall convergence.
If convergence is not reached at the edges, insert permalloy in the DY corners to achieve proper convergence. Recheck for purity and readjust if necessary.
After vertical adjustment of the yoke, insert wedge at 11 o'clock position, then make the horizontal tilt adjustment.
Secure the deflection yoke by inserting four side wedges.
Apply adhesive between tab (thin portion) of wedge and CRT and place tape over the tab to secure to the CRT.

12.1. DYNAMIC CONVERGENCE ADJUSTMENT

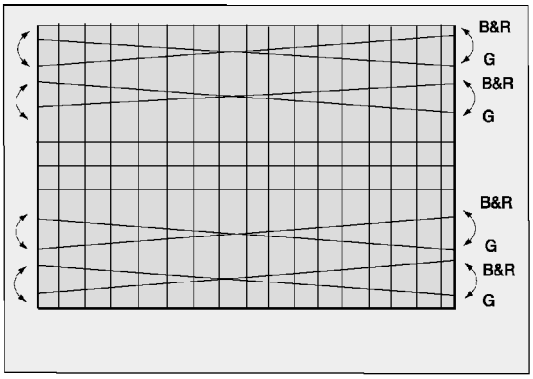
Use this for a precisely overall convergence adjust at the edges.

DY(YHC, YV, XV) ADJUSTMENT

YV ADJUSTMENT / (VR1 FOR HORIZONTAL DYNAMIC CONVERGENCE)

1. **Apply a crosshatch pattern.**
2. **Adjust contrast and brightness customer controls to obtain a correct picture.**
3. **With a driver adjust VR1 (located in deflection yoke board to obtain a proper corvergence at top and bottom of the screen**

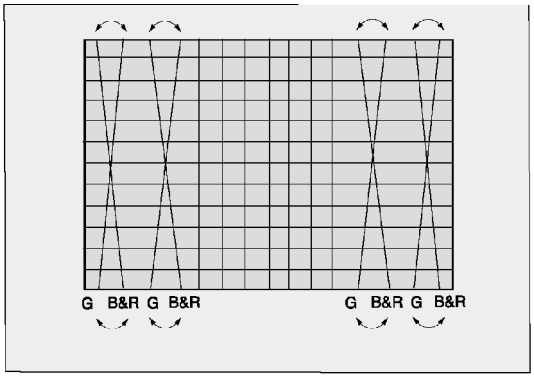
VR1 adjustment (YV)



YH Adjustment / (VR2 for vertical dynamic convergence)

1. **Apply a crosshatch pattern.**
2. **Adjust contrast and brightness customer controls to obtain a correct picture.**
3. **With a driver Adjust VR2 (located in deflection yoke board to obtain a proper corvergence at left and right side of the screen.**

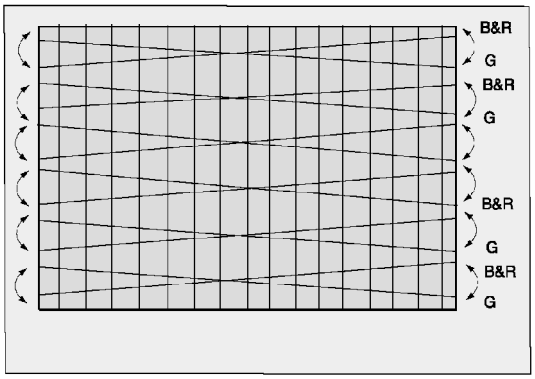
VR2 adjustment (YH)



XV Adjustment (precise adjustment)

1. **Apply a crosshatch pattern.**
2. **Adjust contrast and brightness customer controls to obtain a correct picture.**
3. **With a driver adjust the coil located in deflection yoke board to obtain a proper convergence horizontally.**

Xv adjustment



NOTE
Apply a red pattern and confirm purity, if purity is poor, repeat purity adjustments.

12.2. Permalloy convergence corrector strip (Part No. 0FMK014ZZ)

This strip is used in some sets to match the yoke and CRT for optimum convergence. If the yoke or CRT is replaced, the strip may not be required.
First converge the set without the strip and observe the corners.
First converge the set without the strip and observe the corners.
If correction is needed:

1. **Place strip between CRT and yoke, in quadrant needing correction. Slowly move it around for desired results.**
2. **Press adhesive tightly to the CRT and secure with tape.**

12.3. DAF adjustment / (Dynamic focus adjustment)

The purpose of this adjustment is to move the focus in the picture, so the focus is in balance in the whole picture (same level). Perform this adjustment as a visual adjustment, centering both waveforms, repeat adjustment until best adjustment isobtained.

PREPARATION

1. **Picture settings normalized.**

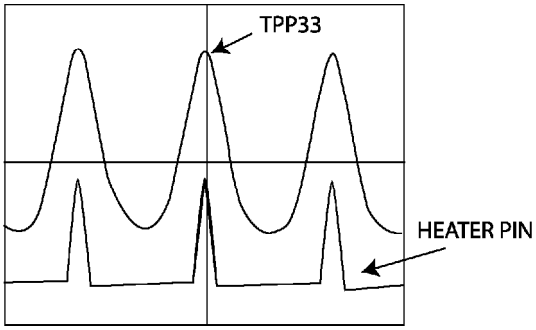
PREPARATION

1. **Apply a crosshatch pattern.**
2. **Connect channel one of the oscilloscope with 100x1 probe to DAF OUT to TPP33 or TPD40 (D-Board).**
3. **Connect channel two of the oscilloscope with 10x1 probe to HEATER (L-Board).**

4. If the the waveforms position are vercally different, adjust (HDAFP) DATA so that become the same position.

NOTE
Both waveforms should be centered. Upper waveform could be different depending on the pattern applied

DAF adjustment



5. Adjust “HDAFW” until TPP33 or TPD40 is 1.6_KVpp ±50Vpp

Other method (DAF adjustment)

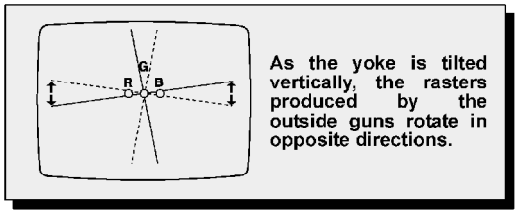
PREPARATION

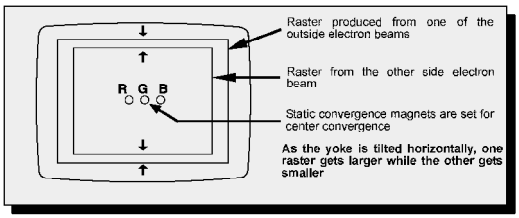
1. Picture settings normalized.

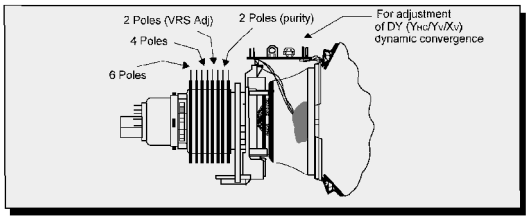
PROCEDURE

1. Apply a crosshatch pattern.
2. Put a mark in the focus control (on fly-back), so the control can be put back in the original position.
3. Turn the focus control (fly-back) fully, so the image is out focus.
4. Then in service mode adjust (HDAFS) DATA, so the focus is moving from side to side in the picture.
5. Adjust (HDAFS) DATA so the picture looks in balance in left and right.
6. Turn focus (fly-back) control back to its original position.

NOTE
Repeat adjustment until best adjustment is obtained. For best adjustment, use oscilloscope as described in previous adjustment method.




R G B
Raster produced from one of the outside electron beams
Raster from the other side electron beam
Static convergence magnets are set for center convergence
As the yoke is tilted horizontally, one raster gets larger while the other gets smaller



13. Service mode (electronic adjustments)

This receiver has electronic technology using the IC bus concept. It performs as a control function and it replaces many mechanical controls. Instead of adjusting mechanical controls individually, many of the control functions are now performedby using “on screen display menu”. (The service adjustment mode).

NOTE

It is suggested that the technician reads all the way through and understand the following procedure for entering/exiting the service adjustment mode; then proceed with the instructions working with the receiver. When becoming familiarwith the procedure, the flow chart for service mode may be used as a quick guide.

Quick entry to service mode

When minor adjustments need to be done to the electronic controls, the method of entering the service mode without removal of the cabinet back is as follows using the remote control:

1. Select SET-UP icon and select CABLE mode.

2. Select TIMER icon and set SLEEP time for 30 Min.

3. Press “ACTION” twice to exit menus.

4. Tune to the channel 124.

5. Adjust VOLUME to minimum (0).

6. Press VOL → (decrease) on receiver. Red “CHK” appears in upper corner.

To toggle between aging and service modes:

While the “CHK” is displayed on the left top corner of the CRT, pressing “ACTION” and “VOL” UP on the TV simultaneously will toggle between the modes. Red “CHK” for serviceand yellow “CHK” for aging.

7. Press POWER on the remote control to display the service adjustment modes menu, select adjustment by pressing the volume right/left buttons and channel up/down buttons on the remote and ACTION to enter the adjustment.

MTS	MTSIN	SEPAL	SEPAH	
CLOCK	CLOCK			HHSTH
VIDEO	COLOR	TINT	BRIGHT	CONT
	B-Y_G	CUT_G	CUT_R	CUT_B
	BRT	R-DR	B-DR	
HDEF	H-POS	H-WID	PCC	
	TOPG	BTMG	TRAP	PARA
FINE	PCCHG	PCCLG	PCCHS	PCCLS
	TOPSL	BTMSL	SIDE	HTRAP
VDEF	V RAS	VEAMP	V-C	V-S
DAF	HDAFS	VDAFW		VPOS
SETID	ID1	ID2	ID3	

Exiting the service mode:

This TV goes out from service mode when it is unplugged or turned OFF. To exit the service mode, turn the TV OFF from or unplug the TV from A.C.

Other method

Press ACTION and POWER on the receiver simultaneously for at least 2 seconds.
The receiver momentarily shuts off; then comes back on tuned to channel 3 with a preset level of sound.
Any programmed channels, channels caption data and some others user defined settings will be erased when exited by pressing ACTION and POWER on receiver.

IMPORTANT NOTE
Always check that the TV exits the service mode.

To confirm colors

When in service mode (red “CHK” is displayed) press RECALL on the remote control to enter the

purity field check mode

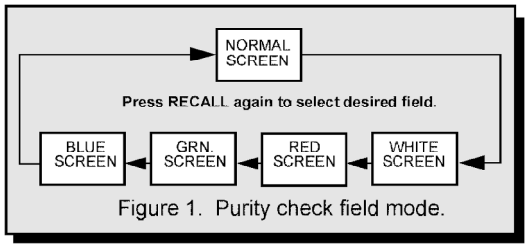


Figure 1. Purity check field mode.

Entering service mode (open-back method)

While the receiver is connected and operating in normal mode, momentarily short test point FA1 (TP1 pin 2) to cold ground (TP1 pin 3).
The receiver enters the aging mode.
Yellow letters "CHK" appear in the upper left corner of the screen. / (The volume right/left and channel up/down will adjust rapidly).

Note:

If service mode is accessed by this method be sure to reset the set after service is performed.

13.1. Service adjustment default values for items

NAME	DESCRIPTION	REGISTER VALUE	
		CT-36SL13G, CT-32SL13G	CT-36SC13G, CT-32SC 3653G
MTSIN	MTS INPUT LEVEL	1D	
SEPAL	MTS LOW LEVEL SEPARATION	06	
SEPAH	MTS HIGH LEVEL SEPARATION	1F	
CLOCK	CLOCK	141	
HHSTH	HHS VOLTAGE LEVEL REFERENCE	EE	
COLOR	COLOR	20	
TINT	TINT	4B	
BRIGH	SUB-BRIGHTNESS	22	
CONT	SUB-CONTRAST	88	
B-Y_G	MAGENTA TINT ADJ	80	
CUT_G	GREEN CUT-OFF	DF	
CUT_R	RED CUT-OFF	BA	
CUT_B	BLUE CUT-OFF	CF	
BRT	BRIGHT	22	
R-DR	RED DRIVE	7A	
B-DR	BLUE DRIVE	77	
H-POS	HORIZONTAL POSITIONING	7F	
H-WID	HORIZONTAL WIDTH	38	
PCC	PINCUSHION CORRECTION	27	
TOPG	TOP CORNER PINCUSHION	15	

NAME	DESCRIPTION	REGISTER VALUE	
		CT-36SL13G, CT-32SL13G	CT-36SC13G, CT-32S 3653G
BTMG	BOTTOM CORNER PINCUSHION	15	
TRAP	TRAPEZOID	84	
PARA	PARALLELOGRAM	13	
PCCHG	PINCUSHION HIGH	07	
PCCLG	PINCUSHION LOW	04	
PCCHS	PINCUSHION HIGH	0F	
PCCLS	PINCUSHION LOW	0F	
TOPSL	TOP CORNER PINCUSHION SLICE LEVEL	05	
BTMSL	BOTTOM CORNER PINCUSHION SLICE LEVEL	04	
SIDE	E-W PINCUSHION ADJUSTMENT	35	
HTRAP	HORIZONTAL TRAPEZOID	10	
VRAS	VERTICAL POSITION	41	
VEAMP	VERTICAL SIZE	BB	
V-C	VERTICAL LINEARITY	21	
V-S	VERTICAL S CORRECTION	11	
HDAFP	DAF	C4	
HDAFW	DAF	88	
VPOS	VERTICAL POSITIONING	7E	
ID1*	ID SWITCH 1	FC	
ID2*	ID SWITCH 2	7F	
ID3*	ID SWITCH 3	7B	48

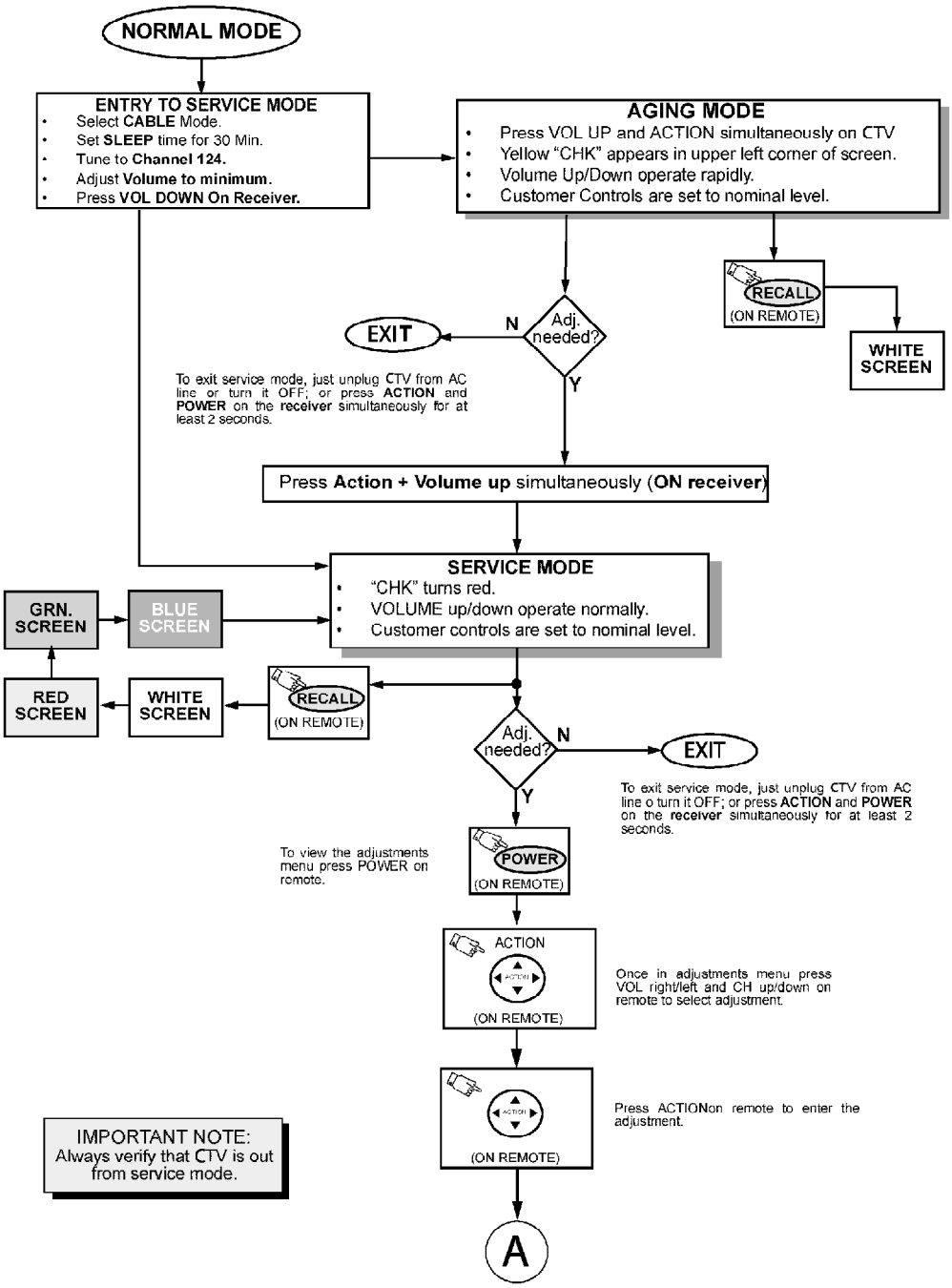
IMPORTANT:

These table values are approximated and could change due to variation of electrical characteristics in each set, except for the ID switch values.

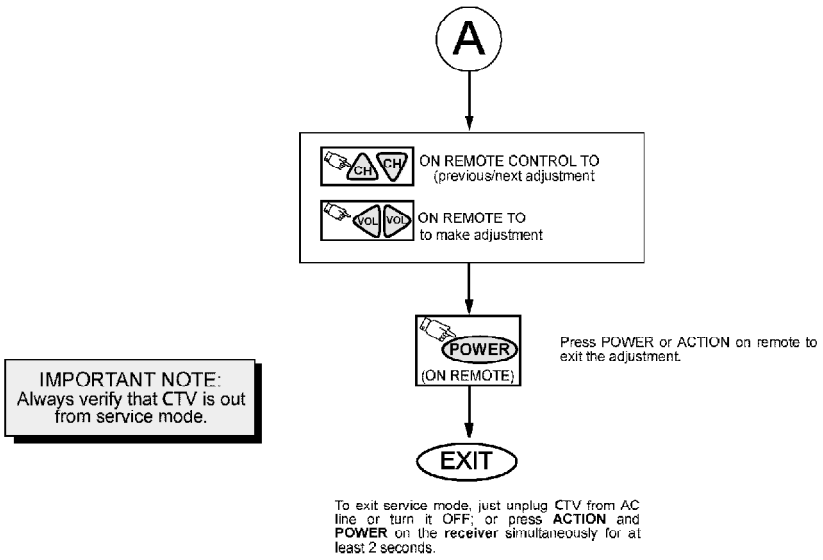
***Note:**

The correspondent ID switch (ID1, ID2, ID3) data configuration should not be modified in any way. If EEPROM circuit needs to be replaced, these ID values should be configured according with this table.

13.2. Instructional flow chart for service mode


NORMAL MODE
ENTRY TO SERVICE MODE
Select CABLE Mode.
Set SLEEP time for 30 Min.
Tune to Channel 124.
Adjust Volume to minimum.
Press VOL DOWN On Receiver.
AGING MODE
Press VOL UP and ACTION simultaneously on CTV
Yellow "CHK" appears in upper left corner of screen.
Volume Up/Down operate rapidly.
Customer Controls are set to nominal level.
RECALL
(ON REMOTE)
WHITE SCREEN
Adj. needed?
N
EXIT
Y
To exit service mode, just unplug CTV from AC line or turn it OFF; or press ACTION and POWER on the receiver simultaneously for at least 2 seconds.
Press Action + Volume up simultaneously (ON receiver)
SERVICE MODE
"CHK" turns red.
VOLUME up/down operate normally.
Customer controls are set to nominal level.
GRN. SCREEN
BLUE SCREEN
RED SCREEN
WHITE SCREEN
RECALL
(ON REMOTE)
Adj. needed?
N
EXIT
Y
To exit service mode, just unplug CTV from AC line o turn it OFF; or press ACTION and POWER on the receiver simultaneously for at least 2 seconds.
To view the adjustments menu press POWER on remote.
POWER
(ON REMOTE)
ACTION
(ON REMOTE)
Once in adjustments menu press VOL right/left and CH up/down on remote to select adjustment.
(ON REMOTE)
Press ACTIONon remote to enter the adjustment.
IMPORTANT NOTE:
Always verify that CTV is out from service mode.
A

13.3. Instructional flow chart for service mode (continued).


A
CH
CH
ON REMOTE CONTROL TO
(previous/next adjustment
VOL
VOL
ON REMOTE TO
to make adjustment
POWER
(ON REMOTE)
Press POWER or ACTION on remote to exit the adjustment.
IMPORTANT NOTE:
Always verify that CTV is out from service mode.
EXIT
To exit service mode, just unplug CTV from AC line or turn it OFF; or press ACTION and POWER on the receiver simultaneously for at least 2 seconds.

14. Service adjustments (electronic controls)

NOTE
Please correlate with available pattern on all adjustments

14.1. Sub-Brightness and Contrast / Service DAC adjustment (BRIGH, CONT)

Adjustment of this control is important for setting proper operation of customer brightness and picture controls. Do not adjust the SCREEN VR after the sub-brightness is set.
This adjustment is factory set. Do not adjust unless repairs are made to associated circuit, the CRT Board or when the CRT is replaced.

Preparation

1. Apply a black and white pattern.

Note:
If a black and withe pattern is not available, a color bar pattern with no color can be used following the same procedure; the waveform will be different

2. Set the PICTURE control to the maximum.

3. Set COLOR control to minimum (no color on picture).

4. Set the BRIGHTNESS control to the center.

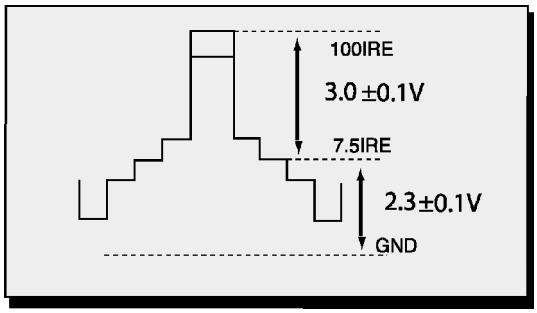
5. Set the SHARPNESS control to the center.

6. Connect the oscilloscope to TP35.

Procedure

1. **In the service mode, select DAC for brightness adjustment “BRIGH”, and adjust data to obtain 2.3±0.1V between 7.5IRE and GND level at TP35. (See waveform detail).**
2. **In service mode, select DAC for contrast adjustment “CONT”, and adjust data to obtain 3.0±0.1V between 7.5IRE and 100IRE level at TP35. (See waveform detail)**

Waveform with black and white pattern applied



14.2. Color output adjustment / Service DAC adjustment (COLOR, TINT)

NOTE
if a rainbow pattern generator is available perform the following procedure; the next section describes the procedure with no rainbow pattern.

Make sure that sub-contrast adjustment was finished prior to perform this adjustment.

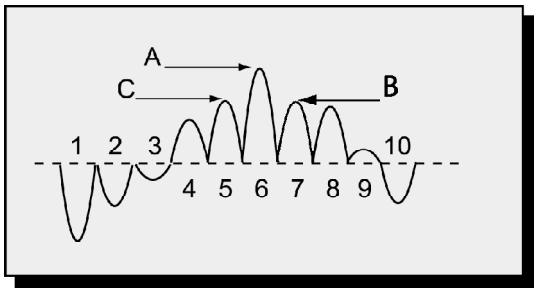
Preparation

1. **Normalize the picture settings.**
2. **Set the BRIGHTNESS control to minimum.**
3. **Set the COLOR control to the center.**
4. **Set the TINT control to the center.**
5. **Set the PICTURE control to the maximum.**
6. **Set the SHARPNESS control to the minimum.**

Procedure

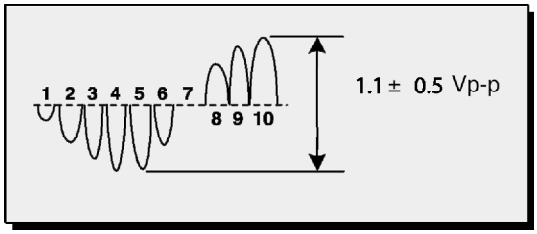
1. **Apply a rainbow color bar pattern.**
2. **Connect the oscilloscope to TP37.**
3. **In service mode adjust “TINT” register until the waveform measured is as the one shown. Tint level from C and B peaks must be almost in the same level and from A and C must be 0.35 Vpp.**

TP37 Waveform.



4. **Connect the oscilloscope to TP35 and GND.**
5. **Adjust “COLOR” register so that the amplitude is 1.1±0.5Vpp.**

TP35 Waveform.



14.3. Color output adjustment / Service DAC adjustment / (COLOR, TINT, B-Y_G)

NOTE
Color and tint adjustment sets the reference settings for the user controls; It is important to read the procedures.

(NO RAINBOW PATTERN)
Make sure that sub-contrast adjustment was finished prior to perform this adjustment

PREPARATION
Normalize the picture settings.

PROCEDURE

1. Apply a color bar pattern.
2. In service mode adjust “R DR” and “B DR” data to “80”.
3. In service mode adjust “TINT” data so that the color does not become greenish or redish.
4. In service mode adjust “COLOR” data so that the color level is not too high (saturated) or too low (tending to black and white).
5. In service mode adjust “B-Y G” data so that blue and green seem natural.
6. Confirm that saturation and picture are normal (normal image).
7. If image is not satisfactory, repeat adjustment until the image is normal and natural.

NOTE
The image can be compared against other set to see the image quality.

14.4. Color temperature adjustment / (B/W Tracking) / Service DAC Adjust. / (CUT R) (CUT G) (CUT B) (R DR) (B DR)

Minor Touch-Up Method
OBSERVE low and high brightness areas of a B/W picture for proper tracking. Adjust only as required for “good gray scale and warm highlights”.

1. LOW LIGHT areas - In service mode for making electronic adjustments, select CUT R, CUT G, CUT B and adjust the picture for gray.
2. HIGH LIGHT areas - In service mode for making electronic adjustments, select drive R DR, B DR and adjust the picture for warm whites.

Complete adjustment

PREPARATION

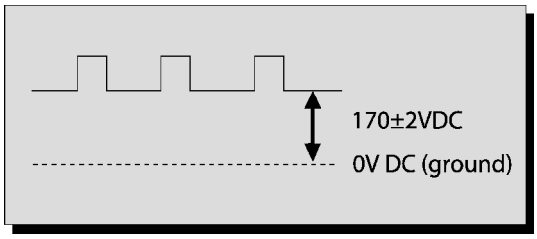
1. Turn the receiver “ON” and allow 30 minutes warm up at WHITE PATTERN.
2. Apply a color bar pattern (with no color).

3. **Turn the SCREEN control (part of FBT T551) fully counterclockwise.**
4. **Preset the following service DACs for best results:**

   - **BRIGH_____1 D0**
   - **CUT R_____02 00**
   - **CUT G_____02 00**
   - **CUT B_____02 00**
   - **R DR_____07 FF**
   - **B DR_____07 FF**

PROCEDURE

1. **Connect the oscilloscope to KG (CRT-Board).**
2. **In service mode for making electronic adjustment, select “BRIGH” DAC to obtain 2.0±0.05V DC.**
3. **Press RECALL button on the remote control to collapse the raster. (service SW).**
4. **Connect oscilloscope to KG on C-Board and adjust service mode “CUT-G” DAC until 170±2V above DC ground is measured**
5. **Remove the probe from KG.**
6. **Turn screen clockwise slowly until color is slightly appeared.**
7. **Then adjust “CUT R” and “CUT B” until line becomes white.**
8. **Press RECALL button on the remote to restore the raster.**
9. **Adjust “R DR” and “B DR” so the white seems like white and black like black.**
10. **Apply a normal signal and confirm that the image is normal and a good gray scale**
11. **If correction is needed perform minor touch-up method.**



14.5. Deflection adjustments

To reset deflection adjustments

To reset deflection adjustments to factory adjusted default, enter to service mode (with red CHK displayed), press POWER button on remote to display the service menu, then press and hold RECALL button for at least three seconds, a reset messagewill appear in the image.
Use this feature when deflection adjustment gets off adjustment to the point that it cannot be adjusted back easily.

14.5.1. H-Center adjustment

PREPARATION

1. **Normalize the picture settings.**

PROCEDURE

1. **Apply a pattern that permits to center the picture.**
2. **If the horizontal center is not aligned, in service mode adjust “H POS” DATA to adjust the horizontal center of the image to the CRT center.**
3. **Verify that horizontal width of the picture is in good balance.**
4. **The image can be compared to another TV adjusted**

14.5.2. H-Width adjustment

PREPARATION

1. **Use a pattern that permits centering the image**
2. **Normalize the picture settings.**

PROCEDURE

1. **Adjust “H WID” DATA so that left width and right become in good balance (not too wide or narrow).**

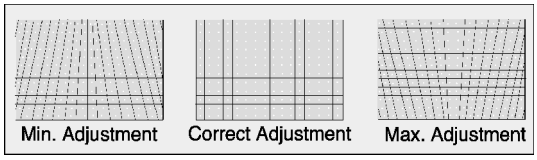
14.5.3. Trapezoid adjustment

PREPARATION

1. **Apply a crosshatch pattern**
2. **Normalize the picture settings.**

PROCEDURE

1. **Enter service mode, select “TRAP” and adjust DATA so that lines at right and left are vertical like a solid line**



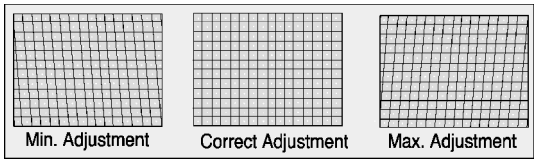
14.5.4. Parallelogram adjustment

PREPARATION

1. **Apply a crosshatch pattern**
2. **Normalize the picture settings.**

PROCEDURE

1. **Enter service mode, select “PARA” and adjust so that the lines at right and left are vertical like solid line.**



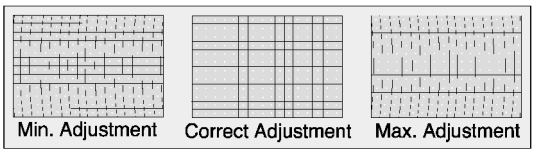
14.5.5. E-W PCC balance adjustment

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.

PROCEDURE

1. Enter service mode, select “SIDE” and adjust so that lines at right and left are vertical like solid line.



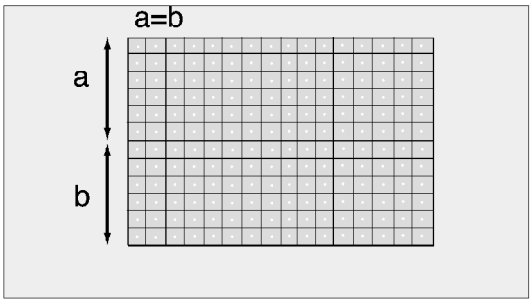
14.5.6. Vertical linearity(V-C), V-Size and V-Position adjustment

PREPARATION

1. Apply a crosshatch pattern
2. Normalize the picture settings.

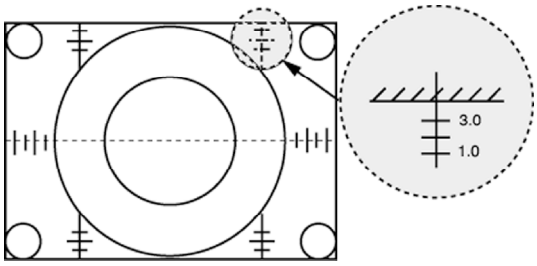
PROCEDURE

1. Enter service mode, select DAC adjustment / “VRAS” and adjust monoscope pattern to the center vertical position of the CRT center mark.



2. Apply a monoscope pattern.
3. Confirm that center horizontal line is in center mark on CRT.
4. Adjust “VEAMP” register to correct vertical size.

Vertical centering adjustment.



14.5.7. V-S Correction adjustment

PREPARATION

1. **Apply a crosshatch pattern**
2. **Normalize the picture settings.**

PROCEDURE

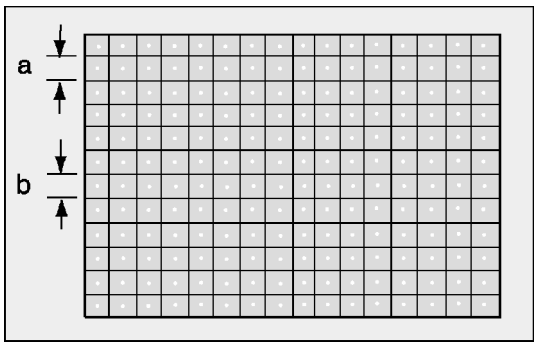
1. **Enter to service mode**
2. **Check a and b sizes, If b-a < -1.5mm (in top & bottom extending case)**

    - Increase “V-S” DATA by one step

NOTE
Repeat “a” and “b” until b-a ± 1.5mm

3. **Confirm to make outermost circle of monoscope pattern a correct circle**

V-Adjustment



14.6. MTS circuit adjustments

The MTS circuit adjustments require two steps:

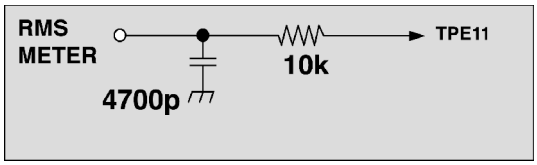
1. Input level adjustment.
2. Stereo separation adjustment.

Input level adjustment / Service DAC adjustment (MTSIN)

PREPARATION

1. Connect an RMS meter with filter jig as shown in figure to TPE11.

Filter Jig



2. Connect an RF signal generator to the RF antenna input.

PROCEDURE

1. Apply the following signal from the RF signal generator:
   - Video: 100 IRE flat field, 30% modulation.
   - Audio: 300Hz, 100% modulation, monaural (70 ±5dB, 75 Ω OPEN, P/S 10dB). Make sure that the 75 μs pre-emphasis is OFF.
2. Adjust the MTS input level adjustment “MTSIN” data until the RMS voltage measured is 130 ± 6.0mVrms.

Stereo separation adjustment (SEPAH)

PREPARATION

1. Connect an R.F. signal generator to the RF antenna input.
2. Connect a scope to TPA10.

PROCEDURE

1. **Select stereo mode in audio menu**
2. **Apply the following signal from the RF signal generator:**

   - Video: 100 IRE flat field, 30% modulation.
   - Audio: 300Hz, 30% modulation, stereo (left only) (70±5dB, 75 Ω OPEN, P/S 10dB).

   NOTE
   After setting 30% modulation with P.L. SW and N.R. SW OFF, turn P.L. SW and N.R. SW ON.

3. **In service mode, adjust the MTS Low-Level separation adjustment "SEPAL" data until the amplitude displayed on the scope is minimum.**
4. **Apply the following signal from the RF signal generator:**

   - Video: 100 IRE flat field, 30% modulation
   - Audio: 3KHz, 30% modulation, stereo (left only) (70 ±5dB, 75 Ω OPEN, P/S 10dB).

   NOTE
   After setting 30% modulation with P.L. SW and N.R. SW OFF, turn P.L. SW and N.R. SW ON.

5. **Adjust the MTS High-level separation adjustment "SEPAH" until the amplitude displayed on the scope is minimum.**
6. **Repeat above steps 2 through 5 until the amplitude is at minimum for both signals.**

14.7. Clock adjustment (CLOCK)

PREPARATION
Connect the frequency counter from TP017 / (IC001 pin 79) to cold ground

PROCEDURE

1. **Turn the receiver "OFF" with the A.C. power applied.**

2. **Measure TP017 (IC001 pin 79) for the frequency of the waveform and record the reading.**

NOTE

3. **TP017 (IC001 pin 79) measurement must have at least four digits of resolution following the decimal point. Example: 000.0000**
4. **Place the receiver into service mode for making electronic adjustment, select the clock adjustment DAC “CLOCK”.**
5. **Calculate and set “CLOCK” based on the following formula:**

$$CLOCK = 128 - \left[\frac{(TP017_{freq} - 610.35)}{610.35} \times 450000\right]$$

NOTE
TP017 (IC001 pin 79) measurement will not change regardless of the value stored in CLOCK.

14.8. Service Adjustments Mechanical Controls

WIDTH CORRECTION ADJUSTMENT

Note
Perform this adjustment only when FBT is changed.

FOCUS (PART OF T551)

Preparation
Apply a crosshatch pattern with dots.

Procedure

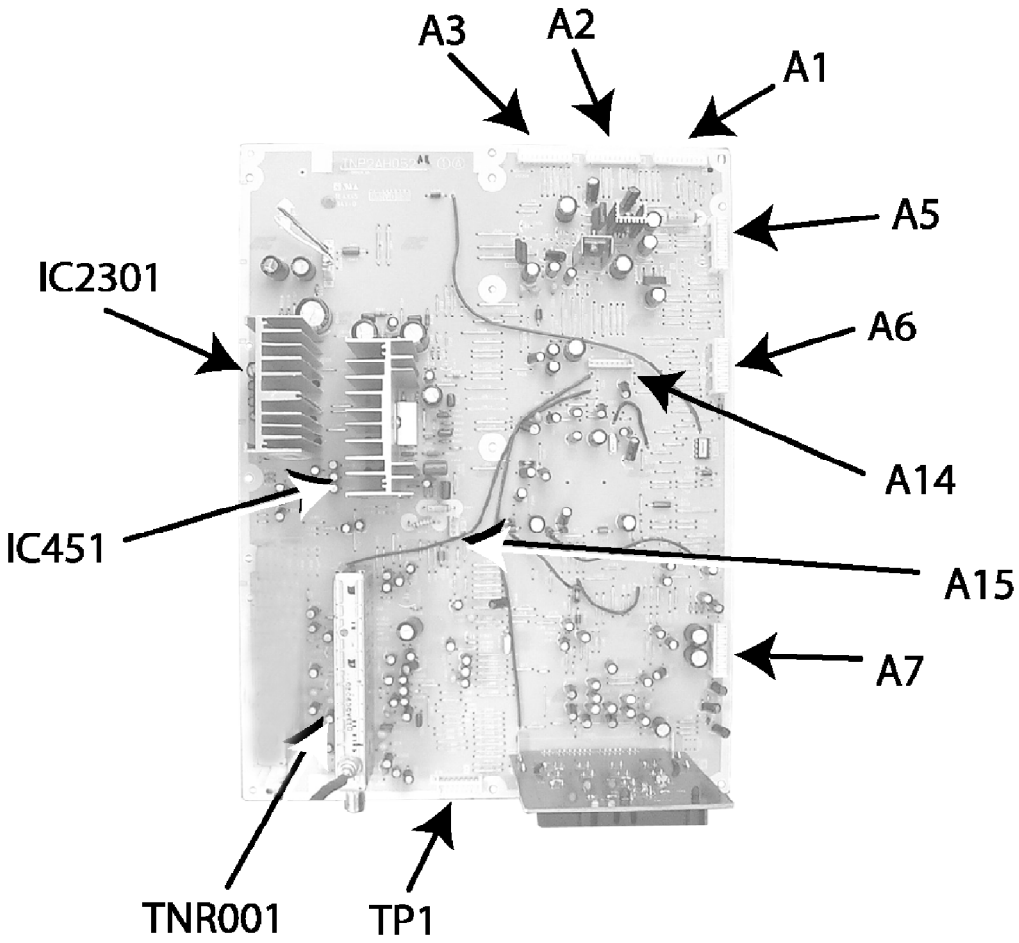
1. **Adjust the FOCUS VR to obtain the sharpest and clearest dot pattern.**

    - Adjust for best center.
    - Adjust for best area between the center and top right corner.

15. Identification of Components

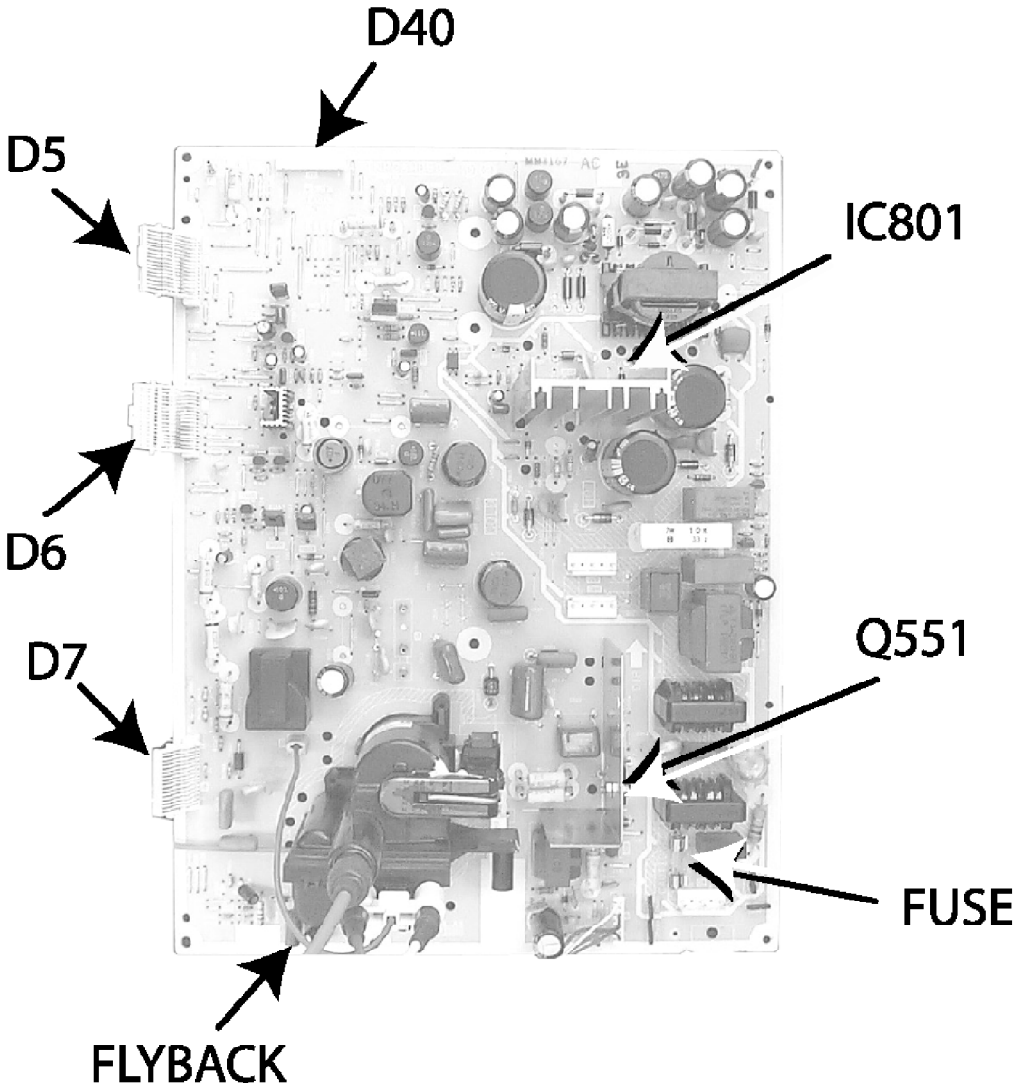
15.1. A-Board components

A-Board components



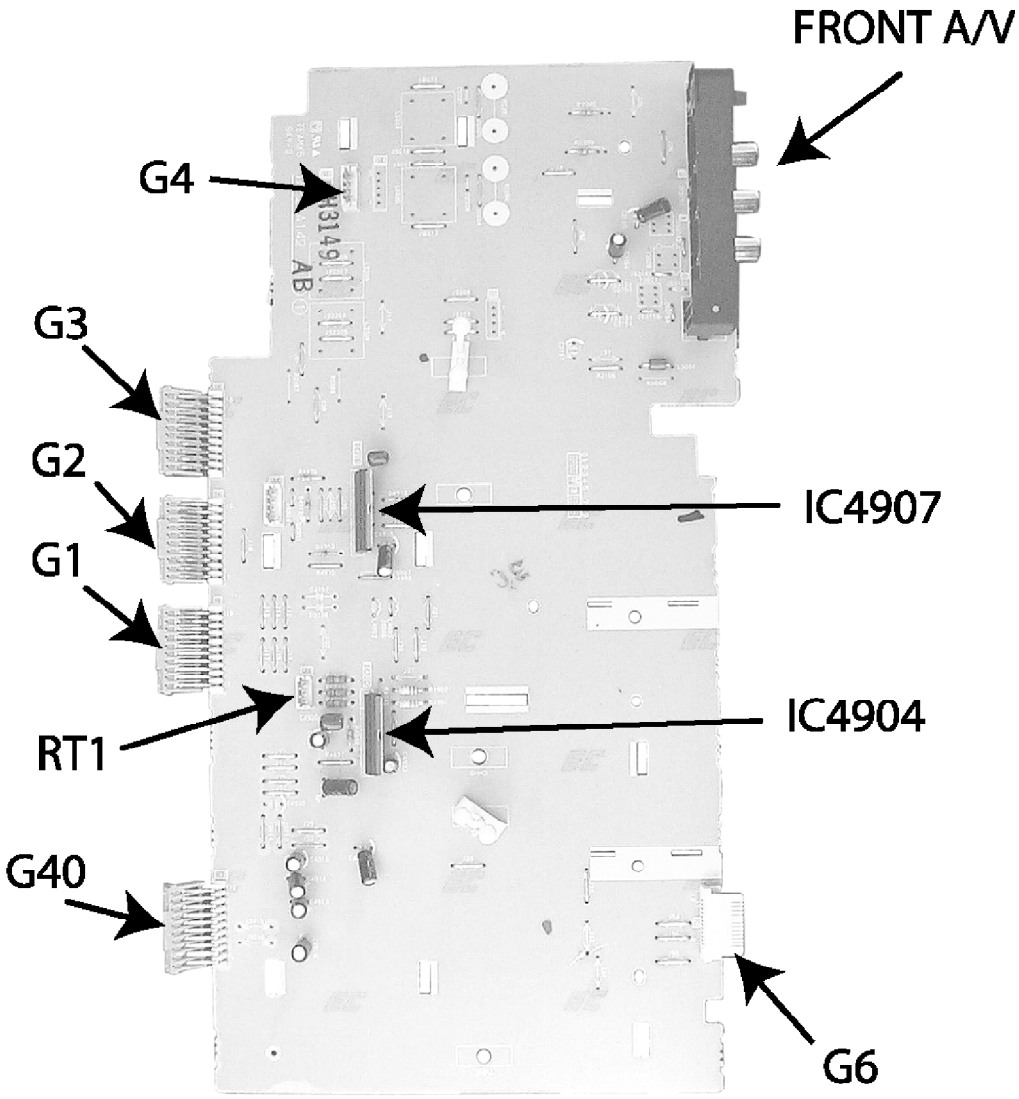
15.1.1. D-Board components

D-Board components



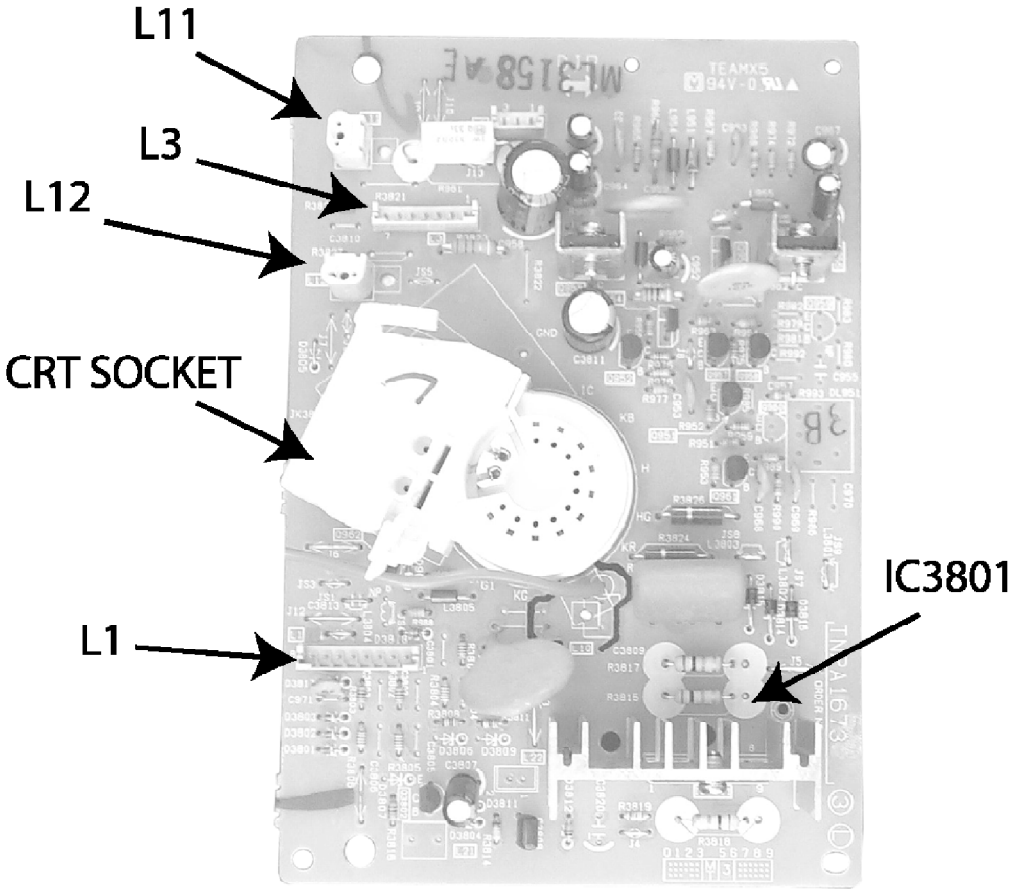
15.1.2. G-Board components

G-Board components



15.1.3. L-Board components

L-Board components



16. Reference for PDF colors

DESCRIPTION OF PDF LINK COLORS	
TYPE	DESTINATION
SCHEMATIC	
YELLOW ON IC	IC ON PCB
YELLOW ON CONNECTOR	CONNECTOR ON PCB
YELLOW ON SCHEMATIC	PCB
CYAN	WAVEFORM
GREEN ON SIDE	SCHEMATIC CONTINUED
GREEN ON CONNECTOR	CONNECTOR CONNECTION
BLUE ON IC	VOLTAGE
PCB	
BLUE ON IC	IC ON SCHEMATIC
BLUE ON CONNECTOR	CONNECTOR ON SCHEMATIC
BLUE ON PCB	SCHEMATIC
GREEN ON SIDE	PCB CONTINUED
BLOCK DIAGRAMS	
GREEN ON IC	IC ON SCHEMATIC
GREEN ON SIDE	BLOCK DIAGRAM CONTINUED

17. Conductor views

17.1. A-Board printed circuit 1 of 2

17.2. A-Board printed circuit 2 of 2

17.3. D-Board printed circuit 1 of 2

17.4. D-Board printed circuit 2 of 2

17.5. G-Board (SC models) printed circuit 1 of 2

17.6. G-Board (SC models) printed circuit 2 of 2

17.7. G-Board (SL models) printed circuit 1 of 2

17.8. G-Board (SL models) printed circuit 2 of 2

17.9. L-Board printed circuit

17.10. K-Board printed circuit

18. Block diagrams

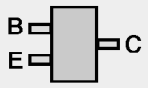
18.1. Video signal block diagram
18.2. Audio signal block diagram
19. Schematics
19.1. English schematic notes

Notes:

IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A ⚠ IN THE SCHEMATIC.

CHIP TRANSISTOR LEAD DESIGNATION



SCHEMATIC NOTES

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in μH.
4. Test point indicated by ; Test point but no pin .
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**; ⏚ indicates COLD GROUND.

NOTE: All other component symbols are used for engineering design purposes.

VOLTAGE MEASUREMENTS

1. Voltage measurement:
   - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min.
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter.
   Incorrect ground connection will result in erroneous readings.

CAUTION: ***Incorrect ground connection of the test equipment will result in erroneous readings.***

WAVEFORM MEASUREMENTS

1. ③ indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
2. Taken with an NTSC signal generator connected to the antenna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
3. Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to "MIN".
4. All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
5. Ground symbol ⏚ shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.

CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.

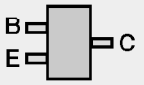
19.2. Notas de esquemáticos en español

Notas

NOTA DE SEGURIDAD

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRITICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRITICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO ⚠.

IDENTIFICACIÓN DE TERMINALES PARA TRANSISTORES EN *CHIP*



NOTAS DE LOS DIAGRAMAS

1. Las Resistencias son de Carbón de 1/4W, a menos que se indique otra característica.
2. Los Capacitores son de Cerámica para 50V, a menos que se indique otra característica.
3. El valor indicado de las Bobinas es la inductancia expresada en μH.
4. Los puntos de prueba en la terminal de algún componente son indicados por ● Los puntos de prueba fuera de los componentes se indican con ●.
5. Los componentes señalados con el símbolo ⚠ son considerados componentes críticos y deben ser reemplazados sólo con las partes especificadas por el fabricante.
6. ▬▬ (**LINEA GRUESA**) indica las líneas de alimentación de los Voltajes B+.
7. Los diagramas eléctricos están sujetos a cambio sin previo aviso.
8. El símbolo ⏚ indica que es una conexión a **Tierra Caliente** y el símbolo ⏚ indica conexión a **Tierra Fría**.

NOTA: Los demas símbolos de componentes incluidos son usados con fines de diseño.

MEDICIÓN DE VOLTAJES

1. Medición de voltaje:
   - El voltaje de entrada al Receptor es de 120V de Corriente Alterna. Un generador de patrones con formato NTSC se conecta a la entrada de la antena. (Patrón de Barras de Colores con 100 IREs para el Blanco y 7.5 IREs para el Negro.)
   - Los ajustes de los Menus Picture y Audio se normalizan.
     En el Menú Set-Up, en la opción ANTENA, se selecciona el modo de CABLE.
     El nivel de Volumen se minimiza.
     De los modos TV y Video, seleccionar el modo TV.
     Seleccionar modo Estereo del Audio.
   - Las mediciones de los voltajes son nominales y pueden variar hasta 10% en componentes en funcionamiento. Las lecturas de los voltajes pueden variar por la potencia de la señal y el contenido de la imagen.
   - Las fuentes de voltajes son nominales.
2. El símbolo ⏚ indica el tipo de tierra que se utiliza en la conexión del medidor.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

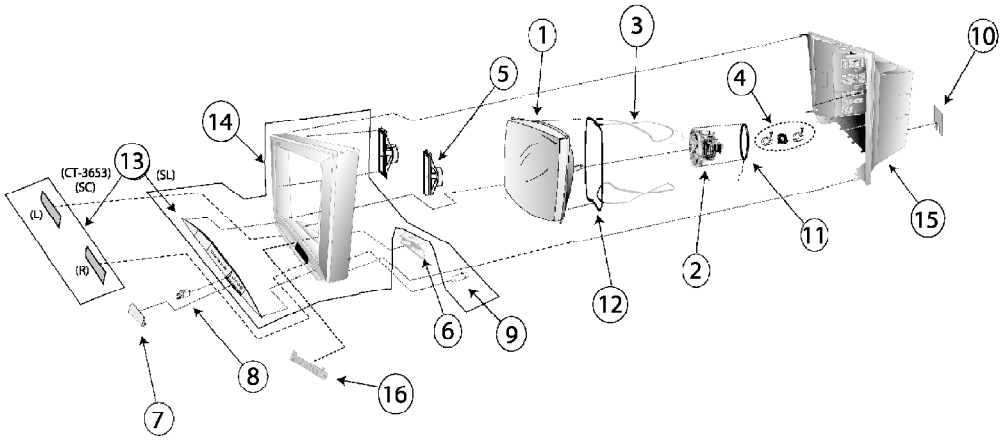
MEDICIÓN DE FORMAS DE ONDA

1. Un símbolo como ③ indica el punto para medir una señal. (La medición puede hacerse en el punto con mayor accesibilidad, siempre que sea común al indicado.)
2. Se midieron utilizando un generador con formato NTSC conectado a la terminal de la antena. (Patrón de 8 Barras de Colores EAI, formato NTSC de 100 IREs para el Blanco y 7.5 IREs para el Negro.)
3. Los ajustes de usuario de los Menus PICTURE y AUDIO se normalizaron. Posteriormente el nivel de volumen se ajusta al mínimo.
4. Las formas de onda de Video y Color fueron tomadas con un osciloscopio de banda alta y con un punta de prueba de baja capacitancia (10 a 1). La forma y amplitud de las ondas puede variar según el tipo de osciloscopio que se utilice y sus características.
5. El símbolo de tierra ⏚ que aparece junto al número de la forma de onda, indica que se utiliza conexión a **Tierra Caliente** en el extremo negativo de la punta de prueba.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

19.3. A-Board schematic TNP2AH052NIL/AA (1 of 3)
19.4. A-Board schematic TNP2AH052NIL/AA (2 of 3)
19.5. A-Board schematic TNP2AH052NIL/AA (3 of 3)
19.6. D-Board schematic TNP2AH053NIL/AB (1 of 2)
19.7. D-Board schematic TNP2AH053NIL/AB (2 of 2)
19.8. G-Board (SC models) schematic TNP2AA141 (1 of 2)
19.9. G-Board (SC models) schematic TNP2AA141 (2 of 2)
19.10. G-Board (SL models) schematic TNP2AA142AB (1 of 2)
19.11. G-Board (SL models) schematic TNP2AA142AB (2 of 2)
19.12. L-Board schematic TNPA1673AE (1 of 2)
19.13. L-Board schematic TNPA1673AE (2 of 2)
19.14. K-Board schematic TNP2AA143
19.15. Voltages
19.16. Waveforms

20. Parts Location



21. Parts List

21.1. Parts List Notes

Important Safety Notice

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use manufacturer's specified parts.

Abbreviation of part name and description

1. Resistor

Example :

ERD25TJ104 **C** 100KΩ, **J**, 1/4W
Type Allowance

Type	Allowance
C : Carbon	F : ± 1%
F : Fuse	G : ± 2%
M : Metal Oxide Metal Film	J : ± 5% K : ± 10%
S : Solid	M : ± 20%
W : Wire Wound	

2. Capacitor

Example :

ECKF1H103ZF **C** 0.01µF, **Z**, 50V
Type Allowance

Type	Allowance
C : Carbon	C : ± 0.25pF
E : Electrolytic	D : ± 0.5pF
P : Polyester Polypropylene	F : ± 1pF G : ± 3%
T : Tantalum	J : ± 5%
	K : ± 10%
	L : ± 15%
	M : ± 20%
	P : ± 100%, -0%
	Z : ± 80%, -20%

21.2. Parts List

Ref. No.	Part No.	Part Name & Description	Remarks
		CAPRISTORS	
CRA801	TP00842-51	TAPING GAP TERMINAL	⚠
CRA802	TP00842-51	TAPING GAP TERMINAL	⚠
CRA803	TP00842-51	TAPING GAP TERMINAL	⚠
CRA804	TP00842-51	TAPING GAP TERMINAL	⚠
		CAPACITORS	
C004	TCJ2VC1H121J	CAP C 120PF-J-50V	
C005	ECA1CM470B	CAP E 47UF/16V	
C006	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C007	TCJ2VC1H121J	CAP C 120PF-J-50V	
C008	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C009	TCJ2VC1H101J	CAP C 100PF-J-50V	
C012	ECA1HM220B	CAP E 22UF-50V	
C013	TCJ2VC1H680J	CAP C 68PF-J-50V	
C014	TCJ2VC1H390J	CAP C 39PF-J-50V	
C015	TCJ2VC1H120J	CAP C 12PF-J-50V	
C016	ECA1EM471B	CAP E 470UF-25V	
C017	TCJ2VC1H680J	CAP C 68PF-J-50V	
C018	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C020	ECA0JM221B	CAP E 220UF-6.3V	
C021	TCJ2VC1H101J	CAP C 100PF-J-50V	
C022	ECA1HM220B	CAP E 22UF-50V	
C023	TCJ2VF1H103Z	CAP C .01UF-Z-50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C024	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C025	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C026	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C028	TCJ2VB1H103K	CAP C .01UF-K-50V	
C030	TCJ2VB1H103K	CAP C .01UF-K-50V	
C031	TCJ2VC1H270J	CAP C 27PF-J-50V	
C032	ECA1HM101B	CAP E 100UF-50V	
C038	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C039	TCJ2VB1H221K	CAP C 220PF-K-50V	
C040	ECA0JM102B	CAP E 1000UF-6.3V	
C041	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C042	ECA1HMR22B	CAP E .22UF-50V	
C043	ECA1HM2R2B	CAP E 2.2UF-50V	
C044	ECA1CM101B	CAP E 100UF/16V	
C046	ECJ2VF1H104Z	CAP C .1UF-Z-50V	
C047	ECA1HM100B	CAP E 10UF/50V	
C048	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C051	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C052	ECA1CM101B	CAP E 100UF/16V	
C053	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C054	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C055	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C056	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C059	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C061	ECA1HM100B	CAP E 10UF/50V	
C062	ECA1HM100B	CAP E 10UF/50V	
C063	ECJ2VF1C104Z	CAP C .1UF-Z-16V	
C064	ECA1CM101B	CAP E 100UF/16V	
C065	ECJ2VF1C104Z	CAP C .1UF-Z-16V	
C066	TCJ2VC1H330J	CAP C 33PF-J-50V	
C067	TCJ2VC1H680J	CAP C 68PF-J-50V	
C068	ECA1HM100B	CAP E 10UF/50V	
C069	TCJ2VB1H221K	CAP C 220PF-K-50V	
C070	ECA0JM102B	CAP E 1000UF-6.3V	
C071	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C074	ECA1HM4R7B	CAP E 4.7UF-50V	
C077	ECA1HM100B	CAP E 10UF/50V	
C079	TCJ2VC1H270J	CAP C 27PF-J-50V	
C083	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C085	ECA1HM4R7B	CAP E 4.7UF-50V	
C089	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C090	ECA1CM101B	CAP E 100UF/16V	
C091	TCJ2VC1H680J	CAP C 68PF-J-50V	
C092	TCJ2VC1H680J	CAP C 68PF-J-50V	
C093	TCJ2VC1H680J	CAP C 68PF-J-50V	
C094	ECEA1CN101UB	CAP E 100UF-16V	
C095	ECEA1CN100UB	CAP E 10UF-16V	
C096	ECEA1CN100UB	CAP E 10UF-16V	
C097	ECA1CM221B	CAP E 10UF-16V	
C401	TCJ2VB1H223K	CAP C .022UF-K-50V	
C403	ECA1HM220B	CAP E 22UF-50V	
C453	EEUNA1E220B	CAP E 22UF-25V	
C454	ECA1HHG221B	CAP E 220UF-50V	
C456	ECQB1104JF3	CAP P .10UF-J-100V	

Ref. No.	Part No.	Part Name & Description	Remarks
C457	ECQV1H334JL3	CAP P .33UF-J-50V	
C458	ECQB1H472JF3	CAP P 4700PF-J-50V	
C459	ECQB1224KF3	CAP P .22UF-K-100V	
C460	ECA1EM222E	CAP E 2200UF-25V	
C461	ECA1VM470B	CAP E 47UF/35V	
C462	ECA1EM222E	CAP E 2200UF-25V	
C463	ECQB1H103JF3	CAP P .01UF-J-50V	
C465	ECA1CM101B	CAP E 100UF/16V	
C470	ECQB1H104JF3	CAP P .10UF-J-50V	
C471	ECQB1H104JF3	CAP P .10UF-J-50V	
C495	ECQB1H683JF3	CAP P .068UF-J-50V	
C504	ECKR2H152KB5	CAP C .0015UF-K-500V	
C508	ECQB1H102JF3	CAP P 1000PF-J-50V	
C509	ECKR3A681KBP	CAP C 680PF-K-1KV	
C511	ECWH20272JVY	CAP P 2700PF-J-2KV	⚠
C512	ECKR2H332KB5	CAP C 3300PF-K-550V	
C513	ECQF4153JZH	CAP P .015UF-J-400V	⚠
C514	ECWH20133JVB	CAP P 13000PF-J-2KV	⚠
C518	ECKW3D681KBR	CAP C 680PF-K-2KV	⚠
C519	ECKW3D681KBR	CAP C 680PF-K-2KV	⚠
C520	ECQB1H153JF3	CAP P .015UF-J-50V	⚠
C522	ECKW3D331JBR	CAP C 330PF-J-2KV	⚠
C523	ECWH20362JVY	CAP P 3600PF-J-2KV	⚠
C524	ECQB1224JF3	CAP P .22UF-J-100V	
C525	ECEA1HNR22UB	CAP E .22UF-50V	
C526	ECA2EM470E	CAP E 47UF-250V	
C527	ECKR2H102KB5	CAP C 1000PF-K-500V	
C528	ECA1HM4R7B	CAP E 4.7UF-50V	⚠
C531	ECA160V33UE	CAP E 33UF/160V	⚠
C532	ECQF4273JZH	CAP P .027UF-J-400V	⚠
C540	TCJ2VB1H103K	CAP C .01UF-K-50V	
C553	TACDX2E105J	CAP E 1.0UF-250V	
C560	ECEA1CN470UB	CAP E 47UF-16V	
C561	TCJ2VC1H102J	CAP C .001UF-F-50V	
C562	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C563	TCJ2VC1H102J	CAP C .001UF-F-50V	
C566	ECEA1CN470UB	CAP E 47UF-16V	
C567	TCJ2VC1H101J	CAP C 100PF-J-50V	
C568	ECA1EM471B	CAP E 470UF-25V	
C569	TACDX2E244J	CAP E .24UF-250V	⚠
C572	TACFN2E474J	CAP E .47UF-250V	⚠
C573	ECQE2474KFB	CAP P .47UF-K-200V	
C574	ECA1HM470B	CAP E 47UF-50V	
C580	ECA1CM220B	CAP E 22UF-16V	
C581	ECEA1HN470UB	CAP E 47UF-50V	
C582	ECEA1HN470UB	CAP E 47UF-50V	
C583	ECA1HM010B	CAP E 1UF-50V	
C584	ECA1CM220B	CAP E 22UF-16V	
C585	TCJ2VB1H103K	CAP C .01UF-K-50V	
C586	ECA1CM470B	CAP E 47UF/16V	

Ref. No.	Part No.	Part Name & Description	Remarks
C591	ECA1HM010B	CAP E 1UF-50V	
C592	ECJ2VF1E224Z	CAP C .22UF-Z-25V	
C593	ECA1CM470B	CAP E 47UF/16V	
C751	ECQE1335KFB	CAP P 3.3UF-K-100V	
C756	ECKR2H332KB5	CAP C 3300PF-K-550V	
C763	ECKR3A121KBP	CAP C 120PF-K-1KV	
C800	ECKW3D222KBP	CAP C 2200UF-K-2KVDC	
C801	ECQU2A224BN9	CAP P .22UF-B-250V	⚠
C802	ECQU2A823BN9	CAP P .082UF-B-250V	⚠
C803	ECQM4103KZW	CAP P .01UF-K-400V	
C804	EETED2D561CA	CAP E 560PF-200V	⚠
C805	ECKW2H472PU7	CAP C 4700PF-P-500V	⚠
C806	ECKW2H472PU7	CAP C 4700PF-P-500V	⚠
C807	ECKW2H472PU7	CAP C 4700PF-P-500V	⚠
C808	ECKW2H472PU7	CAP C 4700PF-P-500V	⚠
C809	ECKR1H222KB5	CAP C 2200PF-K-50V	
C810	ECKR1H471KB5	CAP C 470PF-K-50V	
C811	EETED2D561CA	CAP E 560PF-200V	⚠
C812	ECA1HM010B	CAP E 1UF-50V	
C813	ECKW3D102JBP	CAP C 1000PF-J-2KV	
C813	ECKW3D102KBP	CAP C 1000PF-K-2KV CT-32SL13G CT-32SC13G	
C815	ECA1EM471B	CAP E 470UF-25V	
C818	ECA1HM220B	CAP E 22UF-50V	
C827	ECQB1H104JF3	CAP P .10UF-J-50V	
C829	ECA1HHG102E	CAP E 1000UF-50V	
C830	EETED2D561CA	CAP E 560PF-200V	⚠
C831	ECKR3A102KBP	CAP C 1000PF-K-1KV	
C832	ECA1CM332E	CAP E 3300UF-16V	
C833	ECKR3A471KBP	CAP C 470PF-K-1KV	
C834	ECA1CM332E	CAP E 3300UF-16V	
C836	ECKR3A331KBP	CAP C 330PF-K-1KVDC	
C837	ECA1EM222E	CAP E 2200UF-25V	
C839	ECKR3A561KBP	CAP C 560PF-K-1KV	
C840	ECA1EM222E	CAP E 2200UF-25V	
C841	ECA1EM222E	CAP E 2200UF-25V	
C842	ECKR3A331KBP	CAP C 330PF-K-1KVDC	
C843	ECA1VM102E	CAP E 1000UF-35V	
C844	ECKR3A471KBP	CAP C 470PF-K-1KV	
C845	ECA1CM101B	CAP E 100UF/16V	
C848	ECA1CM101B	CAP E 100UF/16V	
C852	ECKCNA222MEB	CAP C 2200PF-M-125V	⚠
C854	ECKCNA222MEB	CAP C 2200PF-M-125V	⚠
C881	ECA1CM101B	CAP E 100UF/16V	
C883	ECA1CM101B	CAP E 100UF/16V	
C884	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C885	ECA1CM471B	CAP E 470UF-16V	
C886	ECA1CM471B	CAP E 470UF-16V	
C887	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C888	ECA1EM471B	CAP E 470UF-25V	
C889	ECA1CM221B	CAP E 10UF-16V	

Ref. No.	Part No.	Part Name & Description	Remarks
C895	ECA1EM101B	CAP E 100UF-25V	
C901	TCJ2VB1H103K	CAP C .01UF-K-50V	
C904	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C952	ECA1HM100B	CAP E 10UF/50V	
C953	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C958	ECA2CM470E	CAP E 47UF-160V	
C959	ECKW2H103KB5	CAP C .01UF-K-500V	
C960	ECCR2H151J5	CAP C 150-500V	
C961	ECA2AM100B	CAP E 10UF-100V	
C962	ECKW2H103KB5	CAP C .01UF-K-500V	
C963	ECCR1H151J5	CAP DISC 150-5-50V	
C964	ECA1CHG101B	CAP E 100UF-16V	
C966	ECA1CHG101B	CAP E 100UF-16V	
C967	ECA1CM221B	CAP E 10UF-16V	
C968	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C969	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C971	ECKR1H222KB5	CAP C 2200PF-K-50V	
C1051	ECJ2VF1H103Z	CAP C .01UF-Z-50V CT-36SL13G CT-32SL13G	
C1051	TCJ2VB1H103K	CAP C .01UF-K-50V CT-36SC13G CT-32SC13G CT-3653G	
C1052	ECA1AM470B	CAP E 47UF-10V CT-36SL13G CT-32SL13G	
C1052	ECA1HM470B	CAP E 47UF-50V CT-36SC13G CT-32SC13G CT-3653G	
C1556	ECA1CM470B	CAP E 47UF/16V	
C1557	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C1559	ECQB1H333JF3	CAP P .033UF-J-50V	
C1560	ECA1HM100B	CAP E 10UF/50V	
C1561	ECA1HM010B	CAP E 1UF-50V	
C1562	ECQM4223KZW	CAP P .022UF-K-400V	
C1563	ECKW3D102KBR	CAP C 1000PF-K-2KV	
C1564	ECKW3D471KBP	CAP C 470PF-K-2KVDC	
C1566	ECA1CM221B	CAP E 10UF-16V	
C1567	ECQB1H104JF3	CAP P .10UF-J-50V	
C1568	ECQB1H104JF3	CAP P .10UF-J-50V	
C1570	ECA1HM2R2B	CAP E 2.2UF-50V	
C1571	ECKR2H471KB5	CAP C 470PF-K-500V	
C1572	ECKW3A332KBP	CAP C 3300PF-K-1KV	
C1575	TACCV101T50V	CAP C 100PF/50V	
C1577	ECKW3D471KBP	CAP C 470PF-K-2KVDC	
C1578	ECQM4223KZW	CAP P .022UF-K-400V	
C1580	ECKW3D471KBP	CAP C 470PF-K-2KVDC	
C2202	ECA1HM2R2B	CAP E 2.2UF-50V	
C2203	ECA1HM4R7B	CAP E 4.7UF-50V	
C2204	AP106K016CAE	CAP T 10UF/16V	
C2205	ECA1HM010B	CAP E 1UF-50V	
C2206	ECQB1H223JF3	CAP P .022UF-J-50V	
C2207	AP335K016CAE	CAP T 3.3UF/16V	
C2208	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2209	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2210	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2211	ECA1HM100B	CAP E 10UF/50V	
C2212	ECQB1H473JF3	CAP P .047UF-J-50V	
C2215	ECA1CM101B	CAP E 100UF/16V	
C2216	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C2218	ECA1HMR47B	CAP E .47UF-50V	
C2219	TCJ2VC1H100D	CAP C 10PF-J-50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C2302	ECA1HM010B	CAP E 1UF-50V	
C2303	TCJ2VB1H392K	CAP C 3900UF-K-50V	
C2304	TCJ2VB1H392K	CAP C 3900UF-K-50V	
C2305	ECA1HM010B	CAP E 1UF-50V	
C2307	ECA1EM102E	CAP E 1000UF-25V	
C2308	ECA1HM101B	CAP E 100UF-50V	
C2311	ECA1HM010B	CAP E 1UF-50V	
C2312	ECA1EM102E	CAP E 1000UF-25V	
C2313	ECA1VM222E	CAP E 2200UF-35V	
C2314	ECA1EM102E	CAP E 1000UF-25V	
C2331	ECA1HM010B	CAP E 1UF-50V	
C2332	ECA1HM010B	CAP E 1UF-50V	
C2333	ECA1HM100B	CAP E 10UF/50V	
C2334	ECA1HM100B	CAP E 10UF/50V	
C2335	ECA1HM010B	CAP E 1UF-50V	
C2336	ECA1HM010B	CAP E 1UF-50V	
C2337	ECA1CM470B	CAP E 47UF/16V	
C2341	ECEA1CN100UB	CAP E 10UF-16V	
C2342	ECEA1CN100UB	CAP E 10UF-16V	
C2350	ECA1CM470B	CAP E 47UF/16V	
C2452	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C2501	TCJ2VB1H332K	CAP C .0033UF-K-50V	
C2502	TCJ2VB1H332K	CAP C .0033UF-K-50V	
C2503	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2504	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2507	TCJ2VB1H472K	CAP C 4700PF-K-50V	
C2508	TCJ2VB1H472K	CAP C 4700PF-K-50V	
C2509	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2510	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2511	ECA1HM010B	CAP E 1UF-50V	
C2512	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2513	ECA1HM4R7B	CAP E 4.7UF-50V	
C2514	ECA1HM4R7B	CAP E 4.7UF-50V	
C2515	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2516	ECA1HM4R7B	CAP E 4.7UF-50V	
C2517	ECA1HM4R7B	CAP E 4.7UF-50V	
C2518	ECA1HM4R7B	CAP E 4.7UF-50V	
C2519	ECA1CM470B	CAP E 47UF/16V	
C2520	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C2531	ECA1HM4R7B	CAP E 4.7UF-50V	
C2532	ECA1HM4R7B	CAP E 4.7UF-50V	
C3001	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C3002	ECA1CM101B	CAP E 100UF/16V	
C3003	ECA1HM100B	CAP E 10UF/50V	
C3004	ECA1HM100B	CAP E 10UF/50V	
C3005	ECA1HM100B	CAP E 10UF/50V	
C3006	ECA1HM010B	CAP E 1UF-50V	
C3007	ECA1HM010B	CAP E 1UF-50V	
C3008	ECA1HM100B	CAP E 10UF/50V	
C3009	TCJ2VB1H103K	CAP C .01UF-K-50V	
C3010	ECA1HM100B	CAP E 10UF/50V	
C3011	ECA1HM010B	CAP E 1UF-50V	
C3012	ECA1HM010B	CAP E 1UF-50V	
C3013	ECA1HM100B	CAP E 10UF/50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C3014	TCJ2VB1H103K	CAP C .01UF-K-50V	
C3018	ECA1HM010B	CAP E 1UF-50V	
C3019	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C3020	ECEA1CN100UB	CAP E 10UF-16V	
C3021	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C3022	ECA1CM101B	CAP E 100UF/16V	
C3023	ECA1HM010B	CAP E 1UF-50V	
C3025	ECA1HM100B	CAP E 10UF/50V	
C3029	TCJ2VF1H333Z	CAP C .033UF-Z-50V	
C3030	TCJ2VF1H333Z	CAP C .033UF-Z-50V	
C3054	ECA1CM471B	CAP E 470UF-16V	
C3154	ECA1HM010B	CAP E 1UF-50V	
C3155	ECA1HM010B	CAP E 1UF-50V	
C3158	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3159	TCJ2VB1H152K	CAP C 1500PF-K-50V	
C3807	ECA1CM221B	CAP E 10UF-16V	
C3808	ECQV1H224JL3	CAP P .22UF-J-50V	
C3809	ECQM4104KZB	CAP P .10UF-K-400V	
C3811	ECA2EM100B	CAP E 10UF/250V	
C3812	ECKR1H222KB5	CAP C 2200PF-K-50V	
C3814	ECKC3D332KBN	CAP C 3300PF-K-2KV	
C4910	ECA1CM470B	CAP E 47UF/16V / CT-36SL13G CT-32SL13G	
C4910	ECA1VM470B	CAP E 47UF/35V CT-36SC13G CT-32SC13GCT-3653G	
C4911	ECQV1H334JL3	CAP P .33UF-J-50V	
C4913	ECEA1CN100UB	CAP E 10UF-16V	
C4914	ECEA1CN100UB	CAP E 10UF-16V	
C4915	ECA1CM220B	CAP E 22UF-16V	
C4916	ECEA1CN220UB	CAP E 22UF-16V	
C4917	ECEA1HN2R2UB	CAP E 2.2UF-50V	
C4920	ECJ2VF1H104Z	CAP C .1UF-Z-50V	
C4921	ECA1CM470B	CAP E 47UF/16V	
C4922	ECJ2VB1C104K	CAP C .1UF-K-16V	
C4923	ECA1VM470B	CAP E 47UF/35V	
C4924	ECA1VM470B	CAP E 47UF/35V	
C4925	ECQB1H104JF3	CAP P .10UF-J-50V	
		DIODES	
D4	K1ZZ00001205	DIODE CT-32SC13G	
D006	MAZ33000ML	DIODE	
D007	MAZ30300LL	DIODE ZENER	
D052	MAZ40620MF	DIODE ZENER	
D053	MAZ40620MF	DIODE ZENER	
D451	B0EAKM000018	DIODE RECTIFIER	
D455	MA2C165001VT	DIODE	
D456	MA2C165001VT	DIODE	
D457	MA2C165001VT	DIODE	
D459	MA2C165001VT	DIODE	
D504	MAZ43000LF	DIODE ZENER	
D507	MAZ40820LF	DIODE ZENER	
D509	MA2C165001VT	DIODE	
D510	MAZ40510MF	DIODE ZENER	
D511	D1NL40V70	DIODE	
D512	D1NL40V70	DIODE	⚠
D551	B0HAMV000018	DIODE	
D552	B0HAMP000059	DIODE	

Ref. No.	Part No.	Part Name & Description	Remarks
D563	MAZ40300HF	DIODE ZENER	
D753	AU01ZV0	DIODE	
D801	RM10BLFA1	DIODE	⚠
D802	RM10BLFA1	DIODE	⚠
D803	RM10BLFA1	DIODE	⚠
D804	RM10BLFA1	DIODE	⚠
D806	EG01AV0	DIODE	
D807	B0HAJP000015	DIODE	
D808	D4DDF1R50001	DIODE	⚠
D810	B0HAJP000015	DIODE	
D811	B0HAJP000015	DIODE	
D813	MA2C165001VT	DIODE	
D814	MA2C17800E	DIODE	
D815	MA2C165001VT	DIODE	
D816	MA2C165001VT	DIODE	
D817	MA2C165001VT	DIODE	
D818	MAZ40680MF	DIODE ZENER	
D819	B0EAKL000008	DIODE RECTIFIER	
D820	B0EAKL000008	DIODE RECTIFIER	
D821	B0EAKL000008	DIODE RECTIFIER	
D822	B0EAKL000008	DIODE RECTIFIER	
D823	B0EAKL000008	DIODE RECTIFIER	
D825	B0HANR000003	DIODE	⚠
D826	AU02ZV0	DIODE	
D827	B0HANL000004	DIODE	
D828	B0HANM000016	DIODE	
D829	B0HANM000016	DIODE	
D830	B0HANL000004	DIODE	
D832	MA2C165001VT	DIODE	
D834	AU02ZV0	DIODE	
D835	MA2C165001VT	DIODE	
D836	MAZ41800MF	DIODE ZENER	
D837	MA2C165001VT	DIODE	
D841	MA2C165001VT	DIODE	
D881	MA2C165001VT	DIODE	
D901	MA2C165001VT	DIODE	
D1001	LN81RPH	DIODE CT-36SL13G CT-32SL13G	
D1001	LN81RPHCF3	DIODE CT-36SC13G CT-32SC13G CT-3653G	
D1551	B0AAGR000002	DIODE SWITCHING	
D1552	MA2C165001VT	DIODE	
D1553	B0HACW000002	DIODE	
D1557	MA2C165001VT	DIODE	
D1558	MA2C165001VT	DIODE	
D2301	MAZ43600HF	DIODE ZENER	
D2302	MA2C165001VT	DIODE	
D2303	MA2C165001VT	DIODE	
D2305	MAZ31100ML	DIODE ZENER	
D2306	MAZ31100ML	DIODE ZENER	
D2307	MAZ31100ML	DIODE ZENER	
D2308	MAZ31100ML	DIODE ZENER	
D2309	MAZ31100ML	DIODE ZENER	
D2310	MAZ31100ML	DIODE ZENER	

Ref. No.	Part No.	Part Name & Description	Remarks
D2311	MAZ31100ML	DIODE ZENER	
D2312	MAZ31100ML	DIODE ZENER	
D2320	MAZ33000ML	DIODE	
D2321	MAZ33000ML	DIODE	
D3001	MAZ31100ML	DIODE ZENER	
D3002	MAZ31100ML	DIODE ZENER	
D3003	MAZ31100ML	DIODE ZENER	
D3004	MAZ31100ML	DIODE ZENER	
D3005	MAZ31100ML	DIODE ZENER	
D3006	MAZ31100ML	DIODE ZENER	
D3007	MAZ31100ML	DIODE ZENER	
D3008	MAZ31100ML	DIODE ZENER	
D3009	MAZ31100ML	DIODE ZENER	
D3010	MAZ31100ML	DIODE ZENER	
D3011	MAZ31100ML	DIODE ZENER	
D3012	MAZ31100ML	DIODE ZENER	
D3013	MAZ31100ML	DIODE ZENER	
D3014	MAZ31100ML	DIODE ZENER	
D3015	MAZ31100ML	DIODE ZENER	
D3016	MAZ31100ML	DIODE ZENER	
D3051	MAZ31100ML	DIODE ZENER	
D3110	MAZ31100ML	DIODE ZENER CT-36SC13GCT-32SC13GCT-3653G	
D3111	MAZ31100ML	DIODE ZENER CT-36SC13G CT-32SC13G CT-3653G	
D3112	MAZ31100ML	DIODE ZENER CT-36SC13G CT-32SC13G CT-3653G	
D3113	MAZ31100ML	DIODE ZENER CT-36SC13G CT-32SC13G CT-3653G	
D3114	MAZ31100ML	DIODE ZENER CT-36SC13G CT-32SC13G CT-3653G	
D3115	MAZ31100ML	DIODE ZENER CT-36SC13G CT-32SC13G CT-3653G	
D3116	MAZ31100ML	DIODE ZENER CT-36SC13G CT-32SC13G CT-3653G	
D3117	MAZ31100ML	DIODE ZENER CT-36SC13G CT-32SC13G CT-3653G	
D3118	MAZ31100ML	DIODE ZENER CT-36SC13G CT-32SC13G CT-3653G	
D3119	MAZ31100ML	DIODE ZENER CT-36SC13G CT-32SC13G CT-3653G	
D3151	MAZ31100ML	DIODE ZENER CT-36SL13G CT-32SL13G	
D3152	MAZ31100ML	DIODE ZENER CT-36SL13G CT-32SL13G	
D3153	MAZ31100ML	DIODE ZENER CT-36SL13G CT-32SL13G	
D3154	MAZ31100ML	DIODE ZENER CT-36SL13G CT-32SL13G	
D3155	MAZ31100ML	DIODE ZENER CT-36SL13G CT-32SL13G	
D3156	MAZ31100ML	DIODE ZENER CT-36SL13G CT-32SL13G	
D3159	MAZ31100ML	DIODE ZENER	
D3160	MAZ31100ML	DIODE ZENER	
D3801	MA2C165001VT	DIODE	
D3802	MA2C165001VT	DIODE	
D3803	MA2C165001VT	DIODE	
D3804	MA2C165001VT	DIODE	
D3812	MAZ41500MF	DIODE ZENER	
D3814	B0AAGP000003	DIODE SWITCHING	
D3815	B0AAGP000003	DIODE SWITCHING	
D3816	B0AAGP000003	DIODE SWITCHING	
D3817	MAZ41500MF	DIODE ZENER	
D3818	MAZ41500MF	DIODE ZENER	
D3819	MAZ41500MF	DIODE ZENER	
D4910	MA2C165001VT	DIODE	
D4911	MA2C165001VT	DIODE	
D4912	MAZ41500MF	DIODE ZENER	
D4913	MAZ41500MF	DIODE ZENER	

Ref. No.	Part No.	Part Name & Description	Remarks
		FUSES	
F801	XBA2A00101	FUSE 6.3A 125V	⚠
		INTEGRATED CIRCUITS	
IC001	MN102H81GTG3	INT CKT	
IC002	TVR2AJ164S	EEPROM ADJUSTED	
IC003	AN78M05LB	PLUS 5V AVR	
IC004	PST9128NR	INT CKT	
IC005	PQ3RD13B	INT CKT	
IC006	PST9142NR	INT CKT	
IC301	AN15931A-E1	INT CKT	
IC451	C1AA00000521	INT. CKT.	
IC510	TC74HC221AF	INT CKT	
IC580	BD3869AF-E2	INT CKT	
IC801	STRW6735LF26	INT. CKT.	⚠
IC802	C0EAS0000024	INT. CKT.	⚠
IC811	PC123FY2	INT CKT	⚠
IC881	AN7805LB	INT CKT	
IC882	AN7809LB	INT CKT	
IC883	C0DAZJG00004	INT. CKT.	
IC2201	AN5849S-E1V	INT CKT	
IC2301	AN5277	INT CKT	
IC2331	C0ABBA000073	INT. CKT.	
IC2501	NJW1137MPTE1	INT CKT	
IC3001	AN15851A-E1	INT CKT	
IC3801	C1AA00000622	INT CKT	
IC4904	C0AABB000107	INT. CKT.	
IC4905	BD3869AF-E2	INT CKT	
IC4907	C0AABB000107	INT. CKT	
		COILS	
L002	ELESN180JA	COIL PEAKING 18UH	
L003	ELELN330KA	COIL PEAKING 33UH	
L004	ELESN330JA	COIL PEAKING 33UH	
L005	ELELN330KA	COIL EPAKING 33UH	
L006	EXCELSA26T	FERRITE BEAD	
L007	ELESN330JA	COIL PEAKING 33UH	
L008	EXCELSA35T	FERRITE BEAD	
L009	EXCELSA26T	FERRITE BEAD	
L014	ELESN2R2KA	COIL PEAKING 2.2UH	
L015	ELESN2R2KA	COIL PEAKING 2.2UH	
L020	EXCELSA35T	FERRITE BEAD	
L027	EXCELDR35V	FERRITE BEAD	
L030	EXCELSA39V	FERRITE BEAD	
L036	EXCELSA26T	FERRITE BEAD	
L069	EXCELSA26T	FERRITE BEAD	
L071	ELESN150JA	COIL PEAKING 15UH	
L402	EXCELSA39V	FERRITE BEAD	
L501	EXCELSA35T	FERRITE BEAD	
L551	ELH5L7714	COIL CT-36SL13G CT-36SC13G CT-3653G	
L551	ELH5L7722	COIL CT-32SL13G CT-32SC13G	⚠
L553	ELHKLB077B	COIL	⚠
L555	EXCELSA35T	FERRITE BEAD	
L556	ELC18B801E	COIL	

Ref. No.	Part No.	Part Name & Description	Remarks
L559	TLUADNB682K	COIL	
L706	EXCELSA26T	FERRITE BEAD	
L751	ELC18B801E	COIL	
L752	TALFP15B103K	LINE FILTER	
L801	ELF21N035A	LINE FILTER	⚠
L802	ELF21N035A	LINE FILTER	⚠
L803	EXCELSA35T	FERRITE BEAD	
L806	EXCELSA26T	FERRITE BEAD	
L814	TALL08T101KA	LINE FILTER	
L815	EXCELSA39E	FERRITE BEAD	
L816	EXCELSA39E	FERRITE BEAD	
L817	EXCELDR35V	FERRITE BEAD	
L818	EXCELDR35V	FERRITE BEAD	
L819	EXCELSA24T	FERRITE BEAD	
L820	EXCELSA24T	FERRITE BEAD	
L821	EXCELDR35V	FERRITE BEAD	
L824	EXCELDR35V	FERRITE BEAD	
L825	TLUADTB121K	COIL	
L826	TLUADTB820K	COIL	
L827	TALL08T470KA	COIL	
L850	ELESN101JA	COIL PEAKING 100UH	
L851	TLUADTB121K	COIL	
L852	EXCELSA26T	FERRITE BEAD	
L951	EXCELSA24T	FERRITE BEAD	
L953	EXCELSA24T	FERRITE BEAD	
L954	EXCELSA24T	FERRITE BEAD	
L955	EXCELSA24T	FERRITE BEAD	
L1551	TALL13N103JB	COIL	
L1552	ELESN330JA	COIL PEAKING 33UH	
L3001	ELESN560JA	COIL PEAKING 56UH CT-36SC13G CT-32SC13G CT-3653G	
L3001	EXCELSA35T	FERRITE BEAD CT-36SL13G CT-32SL13G	
L3805	EXCELSA26T	FERRITE BEAD	
J19	EXCELDR35V	FERRITE BEAD	
J31	EXCELDR35V	FERRITE BEAD	
J147	EXCELDR35V	FERRITE BEAD	
J148	EXCELSA35T	FERRITE BEAD	
TRANSISTORS			
Q009	2SD601ARTX	TRANSISTOR	
Q019	2SD601ARTX	TRANSISTOR	
Q021	2SB709ARTX	TRANSISTOR	
Q022	2SB709ARTX	TRANSISTOR	
Q023	2SB709ARTX	TRANSISTOR	
Q024	2SD601ARTX	TRANSISTOR	
Q025	2SD601ARTX	TRANSISTOR	
Q026	2SD601ARTX	TRANSISTOR	
Q027	2SD601ARTX	TRANSISTOR	
Q302	2SB709ARTX	TRANSISTOR	
Q401	2SB709ARTX	TRANSISTOR	
Q402	2SD601ARTX	TRANSISTOR	
Q453	2SD601ARTX	TRANSISTOR	
Q480	2SA1309ATA	TRANSISTOR	
Q501	2SC3941RTA	TRANSISTOR	
Q502	2SD601ARTX	TRANSISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
Q503	2SD601ARTX	TRANSISTOR	
Q504	2SD601ARTX	TRANSISTOR	
Q551	2SC5902001TV	TRANSISTOR	
Q580	2SD601ARTX	TRANSISTOR	
Q581	2SD601ARTX	TRANSISTOR	
Q582	2SD601ARTX	TRANSISTOR	
Q591	2SD601ARTX	TRANSISTOR	
Q751	B1DACM000001	TRANSISTOR	
Q756	2SC1685QRSTA	TRANSISTOR	
Q757	2SC1685QRSTA	TRANSISTOR	
Q802	2SC1685QRSTA	TRANSISTOR	
Q803	2SC1318STA	TRANSISTOR	
Q804	2SA564AQRSTA	TRANSISTOR	
Q854	2SA19610QAHW	TRANSISTOR	
Q881	2SC1685QRSTA	TRANSISTOR	
Q882	2SB709ARTX	TRANSISTOR	
Q883	2SB709ARTX	TRANSISTOR	
Q901	2SD601ARTX	TRANSISTOR	
Q951	2SC1685QRSTA	TRANSISTOR	
Q952	2SC1685QRSTA	TRANSISTOR	
Q953	2SC1741ASTP	TRANSISTOR	
Q954	2SB1030ATA	TRANSISTOR	
Q955	2SB1569AF51E	TRANSISTOR	
Q956	2SD2400AF51E	TRANSISTOR	
Q957	2SA564AQRSTA	TRANSISTOR	
Q958	2SC1685QRSTA	TRANSISTOR	
Q961	2SC1685QRSTA	TRANSISTOR	
Q962	2SC1685QRSTA	TRANSISTOR	
Q1551	2SC5368LB-T	TRANSISTOR	
Q1553	2SC1685QRSTA	TRANSISTOR	
Q1554	2SC1685QRSTA	TRANSISTOR	
Q1555	B1BAAT000001	TRANSISTOR	
Q2302	2SD601ARTX	TRANSISTOR	
Q2304	2SD601ARTX	TRANSISTOR	
Q2305	2SD601ARTX	TRANSISTOR	
Q2331	2SD601ARTX	TRANSISTOR	
Q2332	2SB709ARTX	TRANSISTOR	
Q2333	2SD601ARTX	TRANSISTOR	
Q2334	2SD601ARTX	TRANSISTOR	
Q2335	2SB709ARTX	TRANSISTOR	
Q2336	2SD601ARTX	TRANSISTOR	
Q3050	2SD601ARTX	TRANSISTOR	
Q3802	2SA564AQRSTA	TRANSISTOR	
Q4901	2SD601ARTX	TRANSISTOR	
		RELAYS	
RL801	TSEH8007	RELAY	⚠
RL802	TSE10814	RELAY	⚠
		RESISTORS	
RM001	PNA4701M04TV	INT CKT CT-36SC13G CT-32SC13G CT-3653G	
RM001	PNA4701M05TV	INT CKT CT-36SL13G CT-32SL13G	
R002	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R003	ERJ6GEYJ331V	RES M 330-J-1/10W	
R004	ERJ6GEYJ102V	RES M 1K-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R005	ERJ6GEYJ331V	RES M 330-J-1/10W	
R006	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R007	ERJ6GEYJ331V	RES M 330-J-1/10W	
R009	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R010	ERJ6GEYJ392V	RES M 3.9K-J-1/10W	
R011	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R012	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R013	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R014	ERJ6GEYJ392V	RES M 3.9K-J-1/10W	
R015	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R016	ERJ6GEYJ121V	RES M 120-J-1/10W	
R017	ERJ6GEYJ121V	RES M 120-J-1/10W	
R020	ERJ6GEYJ121V	RES M 120-J-1/10W	
R021	ERJ6GEYJ101V	RES M 100-J-1/10W	
R022	ERJ6GEYJ101V	RES M 100-J-1/10W	
R023	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R024	ERJ6GEYJ122V	RES M 1.2K-J-1/10W	
R025	ERJ6GEYJ471V	RES M 470-J-1/10W	
R026	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R027	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R028	ERJ6GEYJ202V	RES M 2K-J-1/10W	
R029	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R030	ERJ6GEYJ471V	RES M 470-J-1/10W	
R031	ERJ6GEYJ471V	RES M 470-J-1/10W	
R032	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R033	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R034	ERJ6GEYJ101V	RES M 100-J-1/10W	
R040	ERJ6GEYJ680V	RES M 68-J-1/10W	
R041	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R042	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R043	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R044	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R045	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R047	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R048	ERJ6GEYJ182V	RES M 1.8K-J-1/10W	
R050	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R052	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R053	ERJ6GEYJ101V	RES M 100-J-1/10W	
R054	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R055	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R056	ERJ6GEYJ471V	RES M 470-J-1/10W	
R057	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R058	ERJ6GEYJ101V	RES M 100-J-1/10W	
R059	ERJ6GEYJ121V	RES M 120-J-1/10W	
R060	ERJ6GEYJ471V	RES M 470-J-1/10W	
R061	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R066	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R067	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R068	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R069	ERJ6GEYJ123V	RES M 12K-J-1/10W	
R071	ERJ6GEYJ680V	RES M 68-J-1/10W	
R072	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R073	ERJ6GEYJ471V	RES M 470-J-1/10W	
R074	ERJ6GEYJ471V	RES M 470-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R075	ERJ6ENF3902V	RES M 39K-F-1/10W	
R076	ERJ6ENF6201V	RES M 6.2K-F-1/10W	
R080	ERJ6GEYJ101V	RES M 100-J-1/10W	
R084	ERJ6GEYJ182V	RES M 1.8K-J-1/10W	
R086	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R087	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R088	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R089	ERJ6GEYJ101V	RES M 100-J-1/10W	
R090	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R091	ERJ6GEYJ221V	RES M 220-J-1/10W	
R094	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R097	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R301	ERJ6GEYJ101V	RES M 100-J-1/10W	
R302	ERJ6GEYJ101V	RES M 100-J-1/10W	
R303	ERJ6GEYJ101V	RES M 100-J-1/10W	
R401	ERJ6GEYJ123V	RES M 12K-J-1/10W	
R403	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R404	ERJ6GEYJ471V	RES M 470-J-1/10W	
R405	ERJ6GEYJ122V	RES M 1.2K-J-1/10W	
R406	ERJ6GEYJ821V	RES M 820-J-1/10W	
R450	ERJ6GEYJ821V	RES M 820-J-1/10W	
R451	ERG2FJ221H	RES M 220-J-2W	
R452	ERDS1FJ6R8T	RES C 6.8-J-1/2W	
R453	ER0S2THF1202	RES M 12K-F-1/4W	
R454	ERDS2TJ182T	RES C 1.8K-J-1/4W	
R455	ERDS2TJ512T	RES C 5.1K-J-1/4W	
R456	ERDS2TJ182T	RES C 1.8K-J-1/4W	
R457	ERDS2TJ112T	RES C 1.1K-J-1/4W	
R458	ERDS2TJ562T	RES C 5.6K-J-1/4W	
R459	ERX1SJ1R2P	RES M 1.2-J-1W	
R460	ER0S2THF8201	RES M 8.2K-F-1/4W	
R461	ER0S2THF1401	RES M 140-F-1/4W	
R462	ERJ6GEYJ183V	RES M 18K-J-1/10W CT-32SL13G CT-32SC13G	
R462	ERJ6GEYJ243V	RES M 24K-J-1/10W CT-36SL13G CT-36SC13G CT-3653G	
R468	ERJ6GEYJ104V	RES M 100K-J-1/10W	
R469	ERJ6GEYJ101V	RES M 100-J-1/10W	
R470	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R471	ERJ6GEYJ224V	RES M 220K-J-1/10W	
R472	ERJ6GEYJ123V	RES M 12K-J-1/10W	
R480	ERDS2TJ392T	RES C 3.9K-J-1/4W	
R481	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R482	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R485	ERJ6GEYJ152V	RES M 1.5K-J-1/10W	
R486	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R487	ERJ6GEYJ822V	RES M 8.2K-J-1/10W	
R489	ER0S2THF1202	RES M 12K-F-1/4W	
R490	ER0S2THF5101	RES M 5.1K-F-1/4W	
R491	ER0S2THF1052	RES M 10.5K-F-1/4W	
R500	ERJ6GEYJ471V	RES M 470-J-1/10W	
R501	ERDS2TJ561T	RES C 560-J-1/4W	
R502	ERDS2TJ561T	RES C 560-J-1/4W	
R503	ERG3FJ332H	RES M 2.3K-J-3W	
R504	ERJ6GEYJ561V	RES M 560-J-1/10W	
R505	ERJ6GEYJ102V	RES M 1K-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R506	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R507	ERDS2TJ301T	RES C 300-J-1/4W	
R508	ERDS2TJ562T	RES C 5.6K-J-1/4W	
R509	ERDS2TJ332T	RES C 3.3K-J-1/4W	
R510	ERG2FJ122H	RES M 12K-J-2W	
R512	ERG3SJ222	RES M 2.2K-J-3W	
R513	ERG3SJ222	RES M 2.2K-J-3W	
R514	ER0S2THF3322	RES M 33.2-F-1/4W	
R515	ER0S2THF3482	RES M 34.8K-F-1/4W	
R516	ERDS2TJ101T	RES C 100-J-1/4W	
R517	ERG1SJ103P	RES M 10K-J-1W	
R518	ERDS1FJ1R5T	RES C 1.5-J-1/2W	⚠
R519	ERQ2CJ1R5	RES F 1.5-J-2W	⚠
R520	ERQ14AJ2R2E	RES F 2.2-J-1/4W	⚠
R521	ER0S2THF8871	RES M 8.87K-F-1/4W	⚠
R522	ER0S2THF1401	RES M 140-F-1/4W	⚠
R523	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R525	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R527	ERJ6GEYJ391V	RES M 390-J-1/10W	
R540	ERJ6GEYJ105V	RES M 1M-J-1/10W	
R541	ERJ6GEYJ274V	RES M 270K-J-1/10W	
R542	ERJ6GEYJ124V	RES M 120K-J-1/10W	
R560	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R561	ERJ6ENF2401V	RES M 2.4K-F-1/10W	
R568	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R576	ERQ12AJ101P	RES F 100-J-1/2W	
R580	ERDS2TJ103T	RES C 10K-J-1/4W	
R581	ERDS2TJ472T	RES C 4.7K-J-1/4	
R582	ERDS2TJ472T	RES C 4.7K-J-1/4	
R583	ERDS2TJ472T	RES C 4.7K-J-1/4	
R584	ERJ6GEYJ101V	RES M 100-J-1/10W	
R585	ERJ6GEYJ101V	RES M 100-J-1/10W	
R586	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R587	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R588	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R589	ERJ6GEYJ272V	RES M 2.7K-J-1/10W	
R590	ERJ6GEYJ392V	RES M 3.9K-J-1/10W	
R591	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R592	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R593	ERJ6ENF3900V	RES M 390-F-1/10W	
R594	ERJ6ENF4700V	RES M 470-F-1/10W	
R595	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R713	ERDS2TJ822T	RES C 8.2K-J-1/4W	
R716	ERDS2TJ101T	RES C 100-J-1/4W	
R720	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R756	ERG2FJ820H	RES M 82-J-2W	
R759	ERDS2TJ472T	RES C 4.7K-J-1/4	
R760	ERDS2TJ472T	RES C 4.7K-J-1/4	
R761	ERDS2TJ472T	RES C 4.7K-J-1/4	
R762	ERDS2TJ101T	RES C 100-J-1/4W	
R801	ERF7ZK1R0	RES W 1.0-K-7W	⚠
R802	ERC14GK824D	RES C 820K-K-1/4W	

Ref. No.	Part No.	Part Name & Description	Remarks
R805	ERX12SJR33P	RES M .33-J-1/2W	⚠
R806	ERX12SJR22P	RES M .22-J-1/2W	⚠
R807	ERD25FJ101P	RES C 100-J-1/4W	
R808	ERDS1FJ100T	RES C 10-J-1/2W	
R809	ERDS2TJ681T	RES C 680-J-1/4W	
R811	ERDS2TJ472T	RES C 4.7K-J-1/4	
R812	ERDS2TJ473T	RES C 47K-J-1/4W	
R813	ERG2FJ104H	RES M 100K-J-2W	
R815	ERDS1TJ393T	RES C 3900-J-1/2W	
R817	ERDS2TJ820T	RES C 82-J-1/4W	
R818	ERDS2TJ680T	RES C 68-J-1/4W	
R819	ERDS2TJ472T	RES C 4.7K-J-1/4	
R820	ERDS2TJ473T	RES C 47K-J-1/4W	
R821	ERX12SJ1R0P	RES M 1.0-J-1/2W	
R822	ERX12SJ1R0P	RES M 1.0-J-1/2W	
R823	ERDS2TJ102T	RES C 1K-J-1/4W	
R826	ERDS2TJ103T	RES C 10K-J-1/4W	
R829	ERDS2TJ103T	RES C 10K-J-1/4W	
R830	ERDS2TJ103T	RES C 10K-J-1/4W	
R832	ERD75TAJ825	RES C 8.2MEG-J-3/4W	⚠
R833	ERQ12HKR22P	RES F .22-K-1/2W	
R835	ERDS2TJ101T	RES C 100-J-1/4W	
R836	ERG2SJ273P	RES M 27K-J-2W	
R837	ERDS2TJ222T	RES C 2.2K-J-1/4W	
R838	ERDS2TJ102T	RES C 1K-J-1/4W	
R839	ERDS2TJ182T	RES C 1.8K-J-1/4W	
R842	ERDS2TJ102T	RES C 1K-J-1/4W	
R846	ERDS1FJ473T	RES C 47K-J-1/2W	
R847	ERDS2TJ182T	RES C 1.8K-J-1/4W	
R850	ERX3FJ2R7	RES M 2.7-J-3W	
R852	ERDS1FJ562T	RES C 56K-J-1/2W	
R855	ERDS2TJ913T	RES C 91K-J-1/4W	
R856	ERDS2TJ123T	RES C 12K-J-1/4W	
R857	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R858	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R859	ERDS2TJ103T	RES C 10K-J-1/4W	
R860	ERDS1FJ102T	RES C 1K-J-1/2W	
R864	ERG3SJ180H	RES M 18-J-3W	
R881	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R882	ERJ6GEYJ271V	RES M 270-J-1/10W	
R883	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R884	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R885	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R886	ERDS2TJ181T	RES C 180-J-1/4W	
R902	ERJ6GEYJ122V	RES M 1.2K-J-1/10W	
R903	ERJ6GEYJ561V	RES M 560-J-1/10W	
R905	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R906	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R908	ERJ6GEYJ683V	RES M 68K-J-1/10W	
R909	ERJ6GEYJ333V	RES M 33K-J-1/10W	
R951	ERDS2TJ821T	RES C 820-J-1/4W	
R952	ERDS2TJ223T	RES C 22K-J-1/4W	
R953	ERDS2TJ332T	RES C 3.3K-J-1/4W	

Ref. No.	Part No.	Part Name & Description	Remarks
R954	ERDS2TJ431T	RES C 430-J-1/4W	
R956	ERDS2TJ510T	RES C 51-J-1/4W	
R958	ERDS2TJ391T	RES C 390-J-1/4W	
R959	ERDS2TJ101T	RES C 100-J-1/4W	
R960	ERQ14AJ100P	RES F 10-J-1/4W	
R961	ERQ1CJP331S	RES F 330-J-1W	
R962	ERDS2TJ330T	RES C 33-J-1/4W	
R963	ERDS2TJ330T	RES C 33-J-1/4W	
R964	ERDS2TJ471T	RES C 470-J-1/4W	
R965	ERDS2TJ563T	RES C 56K-J-1/4W	
R966	ERDS1FJ471P	RES C 470-J-1/2W	
R967	ERDS2TJ563T	RES C 56K-J-1/4W	
R968	ERDS2TJ471T	RES C 470-J-1/4W	
R969	ERDS2TJ390T	RES C 39-J-1/2W	
R970	ERDS2TJ2R7T	RES C 2.7-J-1/4W	
R971	ERDS2TJ2R7T	RES C 2.7-J-1/4W	
R972	ERDS2TJ390T	RES C 39-J-1/2W	
R973	ERDS2TJ101T	RES C 100-J-1/4W	
R974	ERDS2TJ333T	RES C 33K-J-1/4W	
R975	ERDS2TJ101T	RES C 100-J-1/4W	
R976	ERDS2TJ101T	RES C 100-J-1/4W	
R977	ERDS2TJ561T	RES C 560-J-1/4W	
R978	ERDS2TJ101T	RES C 100-J-1/4W	
R987	ERDS2TJ821T	RES C 820-J-1/4W	
R988	ERDS2TJ331T	RES C 330-J-1/4W	
R989	ERDS2TJ682T	RES C 6.8K-J-1/4W	
R990	ERDS2TJ471T	RES C 470-J-1/4W	
R993	ERDS2TJ471T	RES C 470-J-1/4W	
R1051	ERJ6ENF1002V	RES M 10K-F-1/10W	
R1052	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R1053	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R1054	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R1055	ERJ6GEYJ512V	RES M 5.1K-J-1/10W	
R1056	ERJ6GEYJ912V	RES M 9.1K-J-1/10W	
R1057	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R1058	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R1059	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R1060	ERJ6GEYJ470V	RES M 47-J-1/10W	
R1061	ERJ6GEYJ101V	RES M 100-J-1/10W	
R1062	ERJ6GEYJ182V	RES M 1.8K-J-1/10W	
R1516	ERDS2TJ470T	RES C 47-J-1/4W	
R1550	ERDS2TJ273T	RES C 27K-J-1/4W	
R1555	ERDS2TJ272T	RES C 2.7K-J-1/4W	
R1563	ER0S2THF5602	RES M 56K-F-1/4W	
R1564	ERDS2TJ362T	RES C 3.6K-J-1/4W	
R1566	ERDS2TJ104T	RES C 100K-J-1/4W	
R1567	ERDS2TJ104T	RES C 100K-J-1/4W	
R1568	ERDS2TJ104T	RES C 100K-J-1/4W	
R1570	ERC12GK104D	RES C 100K-K-1/2W	
R1571	ERG3FJ821H	RES M 820-J-3W	
R1572	ERDS2TJ334T	RES C 330K-J-1/4W	
R1573	ERDS2TJ473T	RES C 47K-J-1/4W	
R1576	ERDS2TJ101T	RES C 100-J-1/4W	
R1579	ERDS2TJ224T	RES C 220K-J-1/4W	

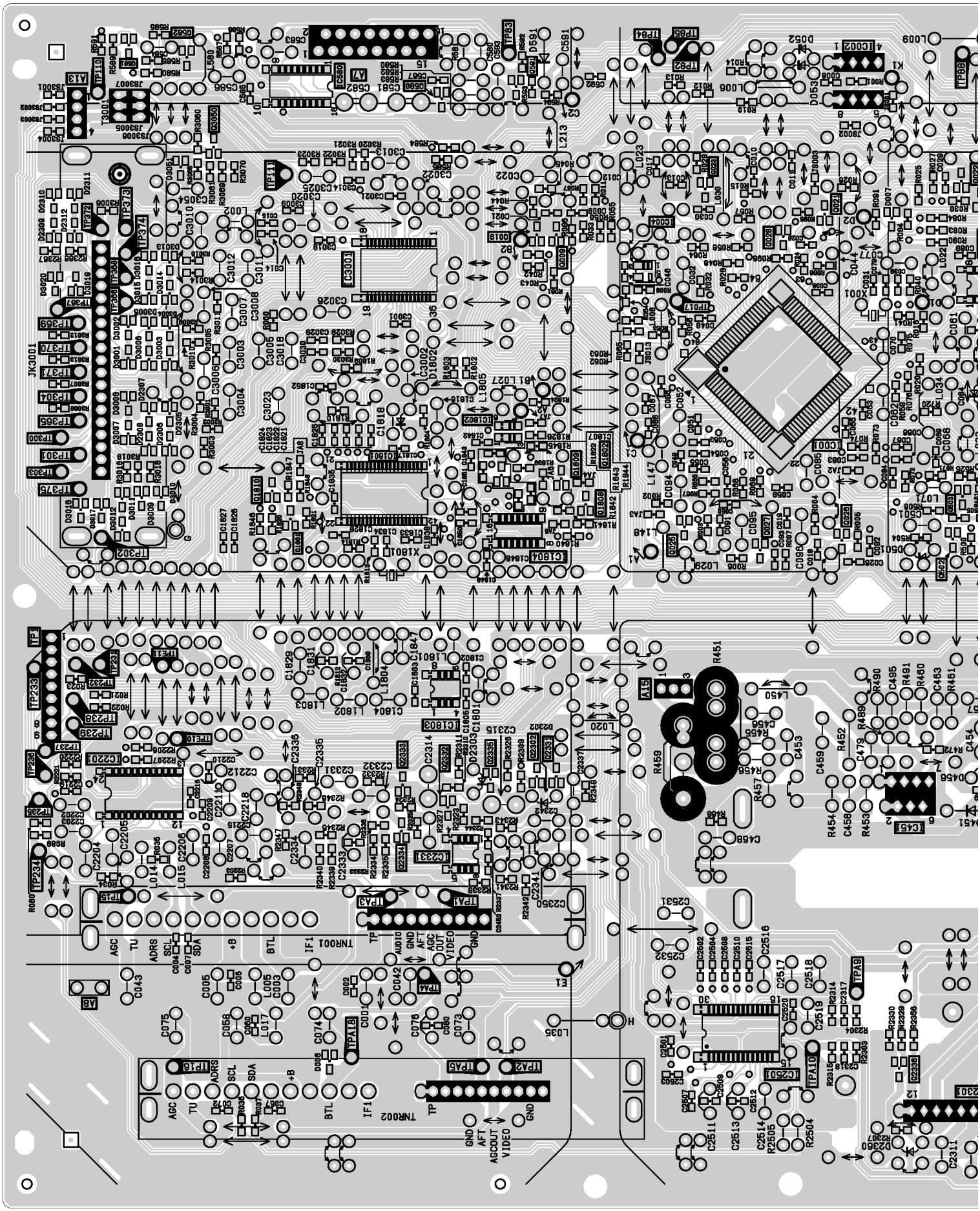
Ref. No.	Part No.	Part Name & Description	Remarks
R1580	ERDS2TJ153T	RES C 15K-J-1/4W	
R1583	ERDS2TJ102T	RES C 1K-J-1/4W	
R1584	ERDS2TJ103T	RES C 10K-J-1/4W	
R1585	ERDS2TJ563T	RES C 56K-J-1/4W	
R1586	ERDS2TJ333T	RES C 33K-J-1/4W	
R1588	RG2FJ472H	RES M 4.7K-J-2W	
R1589	ERG3FJ821H	RES M 820-J-3W	
R1591	ERG3FJ821H	RES M 820-J-3W	
R1593	ERDS2TJ125T	RES C 1.2M-J-1/4W	
R1594	ERDS2TJ125T	RES C 1.2M-J-1/4W	
R2203	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R2206	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2207	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2220	ERJ6GEYJ101V	RES M 100-J-1/10W	
R2221	ERJ6GEYJ273V	RES M 27K-J-1/10W	
R2303	ERJ6GEYJ682V	RES M 6.8K-J-1/10W	
R2304	ERJ6GEYJ682V	RES M 6.8K-J-1/10W	
R2305	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R2306	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2307	ERJ6GEYJ822V	RES M 8.2K-J-1/10W	
R2308	ERJ6GEYJ563V	RES M 56K-J-1/10W	
R2309	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2310	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2311	ERJ6GEYJ271V	RES M 270-J-1/10W	
R2312	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2316	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2317	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2318	ERDS1TJ332T	RES C 3.3K-J-1/2W	
R2319	ERDS1TJ332T	RES C 3.3K-J-1/2W	
R2323	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2324	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2325	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2326	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2329	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2331	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2332	ERJ6GEYJ105V	RES M 1M-J-1/10W	
R2333	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2334	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2335	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R2336	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R2337	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R2338	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R2339	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R2340	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R2341	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2342	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2343	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2344	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2345	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2346	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2347	ERJ6GEYJ105V	RES M 1M-J-1/10W	
R2348	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2349	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R2356	ERJ6GEYJ103V	RES M 10K-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R2366	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R2367	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R2385	ERDS2TJ102T	RES C 1K-J-1/4W	
R2386	ERDS2TJ102T	RES C 1K-J-1/4W	
R2504	ERDS2TJ101T	RES C 100-J-1/4W	
R2505	ERDS2TJ101T	RES C 100-J-1/4W	
R3001	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3002	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3003	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3004	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3005	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3006	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3007	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3008	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3009	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3010	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3011	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3012	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3013	ERJ6GEYJ184V	RES M 180K-J-1/10W	
R3014	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3015	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3018	ERJ6GEYJ750V	RES M 75-J-1/10W	
R3020	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3021	ERJ6GEYJ750V	RES M 75-J-1/10W	
R3022	ERJ6GEYJ750V	RES M 75-J-1/10W	
R3023	ERJ6GEYJ750V	RES M 75-J-1/10W	
R3029	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3030	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3060	ERJ6GEYJ471V	RES M 470-J-1/10W	
R3061	ERJ6GEYJ471V	RES M 470-J-1/10W	
R3065	ERJ6GEYJ100V	RES M 10-J-1/10W	
R3069	ERJ6GEYJ471V	RES M 470-J-1/10W	
R3152	ERJ6GEYJ224V	RES M 220K-J-1/10W	
R3154	ERJ6GEYJ224V	RES M 220K-J-1/10W	
R3801	ERDS2TJ102T	RES C 1K-J-1/4W	
R3802	ERDS2TJ102T	RES C 1K-J-1/4W	
R3803	ERDS2TJ102T	RES C 1K-J-1/4W	
R3804	ER0S2THF1201	RES M 1.2K-F-1/4W	
R3805	ER0S2THF1201	RES M 1.2K-F-1/4W	
R3806	ER0S2THF1201	RES M 1.2K-F-1/4W	
R3808	ER0S2THF1101	RES M 1.1K-F-1/4W	
R3810	ER0S2THF1101	RES M 1.1K-F-1/4W	
R3811	ER0S2THF1101	RES M 1.1K-F-1/4W	
R3814	ER0S2THF8451	RES M 8.45K-F-1/4W	
R3815	ERG1SJ104P	RES M 100K-J-1W	
R3816	ERDS2TJ103T	RES C 10K-J-1/4W	
R3817	ERG1SJ104P	RES M 100K-J-1W	
R3818	ERG1SJ104P	RES M 100K-J-1W	
R3819	ER0S2THF1601	RES M 1.6K-F-1/4W	
R3823	ERQ12AJ121P	RES F 120-J-1/2W	
R3824	ERC12GK222V	RES C 2200-K-1/2W	
R3825	ERC12GK222V	RES C 2200-K-1/2W	
R3826	ERC12GK222V	RES C 2200-K-1/2W	
R4929	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R4930	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R4931	ERJ6GEYJ682V	RES M 6.8K-J-1/10W	
R4932	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R4933	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R4934	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R4935	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R4936	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R4938	ERJ6GEYJ101V	RES M 100-J-1/10W	
R4939	ERJ6GEYJ101V	RES M 100-J-1/10W	
R4942	ERJ6GEYJ101V	RES M 100-J-1/10W	
R4943	ERJ6GEYJ101V	RES M 100-J-1/10W	
R4946	ERJ6ENF5602V	RES M 56K-F-1/10W	
R4947	ERJ6ENF2001V	RES M 2K-F-1/10W	
R4948	ERDS2TJ822T	RES C 8.2K-J-1/4W	
R4949	ERDS2TJ102T	RES C 1K-J-1/4W	
R4950	ERDS1FJ391T	RES C 390-J-1/2W	
R4951	ERX12SJR68P	RES M .68-J-2W	
R4952	ERX12SJR68P	RES M .68-J-2W	
R4953	ERDS1FJ391T	RES C 390-J-1/2W	
R4965	ERJ6ENF1502V	RES M 15K-F-1/10W	
R4966	ERJ6ENF6801V	RES M 6.8K-F-1/10W	
R4968	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R4969	ERJ6GEYJ333V	RES M 33K-J-1/10W	
R4970	ERJ6GEYJ683V	RES M 68K-J-1/10W	
R4971	ERDS2TJ100T	RES C 10-J-1/4W	
R4974	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R4975	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R4976	ERDS1FJ470T	RES C 47-J-1/2W CT-36SC13G CT-32SC13G CT-3653G	
R4976	ERDS2TJ470T	RES C 47-J-1/4W CT-36SL13G CT-32SL13G	
R5013	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
		SWITCHES	
S001	EVQPBD05R	SWITCH CT-36SL13G CT-32SL13G	
S001	EVQPF106K	SWITCH CT-36SC13G CT-32SC13G CT-3653G	
S002	EVQPBD05R	SWITCH	
S003	EVQPBD05R	SWITCH	
S004	EVQPBD05R	SWITCH	
S005	EVQPBD05R	SWITCH	
S006	EVQPBD05R	SWITCH	
S007	EVQPBD05R	SWITCH	
		TRANSFORMERS	
T501	ETH19Y70AY	TRANSFORMER HORIZONTAL DRIVER	
	KFT6AW455F	TRANSFORMER	
T551	TXFFT05GSER	FLYBACK	⚠
T801	ETS35AH165NC	TRANSFORMER	⚠
T802	TLP16297	TRANSFORMER POWER SUPPLY	⚠
T1551	ETF18L108A	TRANSFORMER	⚠
		CRYSTALS/FILTERS	
X001	AF080005BE	CRYSTAL	
		OTHERS	
TNR001	ENG36621G	TUNER	⚠
1	M80LSW095X	CRT 32 INCH	
	A90LSW295X	CRT 36 INCH	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
M001	K3B10CA00041	CRT SOCKET	⚠
2	TLY2AA023	DEFLECTION YOKE (AKME)	⚠
	TLY2AA025	DEFLECTION YOKE (AKME) CT-32SL13G CT-32SC13G CT-36SC13G CT-3653G	⚠
	TLY2AA025	DEFLECTION YOKE (AKME) CT-36SL13G	⚠
M002	TXFYA010EGW	DAG GROUND CT-36SL13G CT-32SL13G CT-32SC13G CT-3653G	
3	TSP2AA016-1	COIL DEGAUSSING CT-32SC13	
	TSP2AA025	COIL DEGAUSSING CT-36SL13G	
	TSP2AA027	COIL DEGAUSSING CT-32SL13G	
	TSP2AA015A	COIL DEGAUSSING CT-36SC13G CT-3653G	
4	TP-13000PX5	CONVERGENCE YOKE CT-36SL13G	
5	EASG18S502A2	SPEAKER CT-36SL13G	
	TAS2AA0024	SPEAKER CT-36SC13G CT-32SC13G CT-3653G	
M003	TXFKP15GSER	SPEAKER BRACKET CT-36SL13G CT-32SL13G	
M004	TXFSPB01BSER	SPEAKER BRACKETS CT-36SC13G CT-32SC13G CT-3653G	
6	TBX2AA0191	BUTTON FUNCTION KEY CT-36SL13G CT-32SL13G	
M005	TXFBX16BSER	POWER BUTTON CT-36SC13G CT-32SC13G CT-3653G	
7	TKP2AA0402S	FRONT DOOR CT-36SC13G CT-32SC13G CT-3653G	
	TKP2AA0722S	FRONT DOOR CT-36SL13G CT-32SL13G	
8	TEK6935	DOOR CATCH CT-36SL13G CT-32SL13G	
	TEK6940	DOOR CATCH CT-36SC13G CT-32SC13G CT-3653G	
9	TKX2AA0181	IR GUIDE CT-32SL13G, CT-36SL13G	
M006	TMM2A30702	WEDGE YOKE CT-36SL13G CT-32SL13G	
10	TMW2A97121	STRAIN RELIEF: AC LINE CORD	
M007	0FMK014ZZ	CONVERGENCE CORRECTOR STRIP CT-36SL13G CT-36SC13G CT-32SC13G CT-3653G	
M008	TSN63115-2	MAGNET PURITY CT-36SL13G CT-32SL13G	
M009	TSN63115-4	MAGNET PURITY CT-36SC13G CT-32SC13G CT-3653G	
11	TSP2AF007	COIL ROTATION	⚠
12	TSP2AF008	COIL GEOMAGNETIC CT-36SL13G CT-36SC13G CT-3653G	⚠
	TSP2AF009	COIL GEOMAGNETIC CT-32SL13G CT-32SC13G	⚠
M010	TSX2AA0351	LINE CORD AC	⚠
13	TXFKP04GSER	FRONT PANELS CT-32SC13G (RIGHT AND LEFT)	
	TXFKP05GSER	FRONT PANELS CT-36SC13G CT-3653G (RIGHT AND LEFT)	
	TTP2AA0732S	FRONT PANEL CT-36SL13G CT-32SL13G	
14	TXFKY02GSER	CABINET FRONT CT-3653G	
	TXFKY03GSER	CABINET FRONT CT-32SC13G	
	TXFKY24GSER	CABINET FRONT CT-36SL13G	
	TXFKY25GSER	CABINET FRONT CT-32SL13G	
	TXFKU02GSER	CABINET FRONT CT-36SC13G	
15	TXFKU05FSER	CABINET BACK CT-32SC13G	
	TXFKU16GSER	CABINET BACK CT-36SL13G	
	TXFKU17GSER	CABINET BACK CT-32SL13G	
	TXFKU03FSER	CABINET BACK CT-36SC13G CT-3653G	
16	TBM2AA0024	BADGE PANASONIC CT-32SC13G, CT-36SC13G, CT-3653G	
JK3151	TJB2AA0371	TERMINAL FRONT A/V CT-36SL13G CT-32SL13G	
JK3001	TJB2AA0491	TERMINAL A/V REAR	
JK3151	TJBA187	JACK A/V OUTPUT CT-36SC13G CT-32SC13G CT-3653G	
		ACCESORIES	
M012	EUR7613Z60	REMOTE CONTROL CT-32SL13G, CT-36SL13G, CT-32SC13G, CT-36SC13G, CT-3653G	
M013	EUR7713010	REMOTE CONTROL CT-3653G	

Ref. No.	Part No.	Part Name & Description	Remarks
M014	TQB2AA0486	OWNER'S MANUAL	
M015	UR76EC0303D	BATTERY COVER REMOTE CON CT-32SL13G, CT-36SL13G, CT-32SC13G, CT-36SC13G	
M016	UR77EC1303A	BATTERY COVER REMOTE CON CT-3653G	



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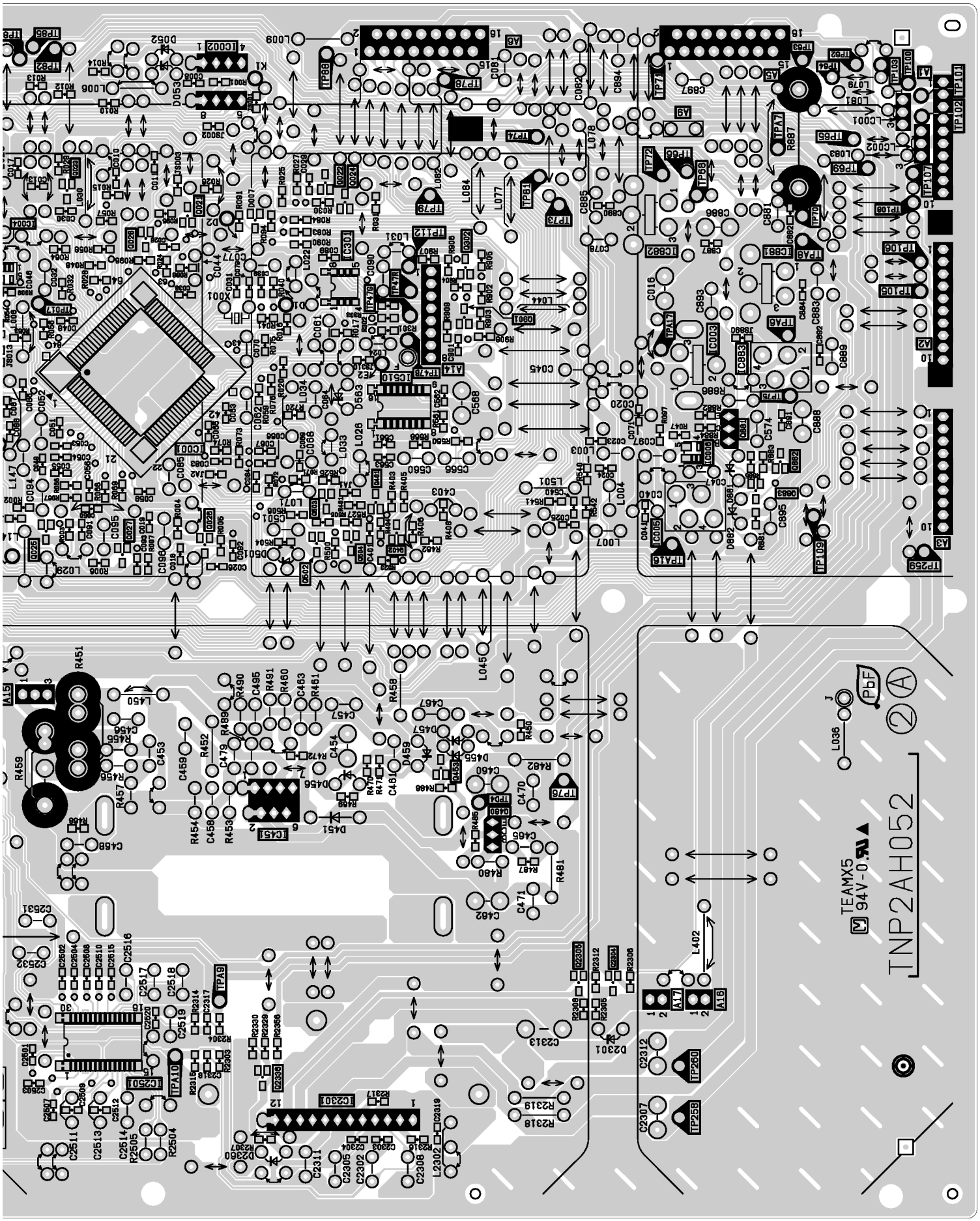
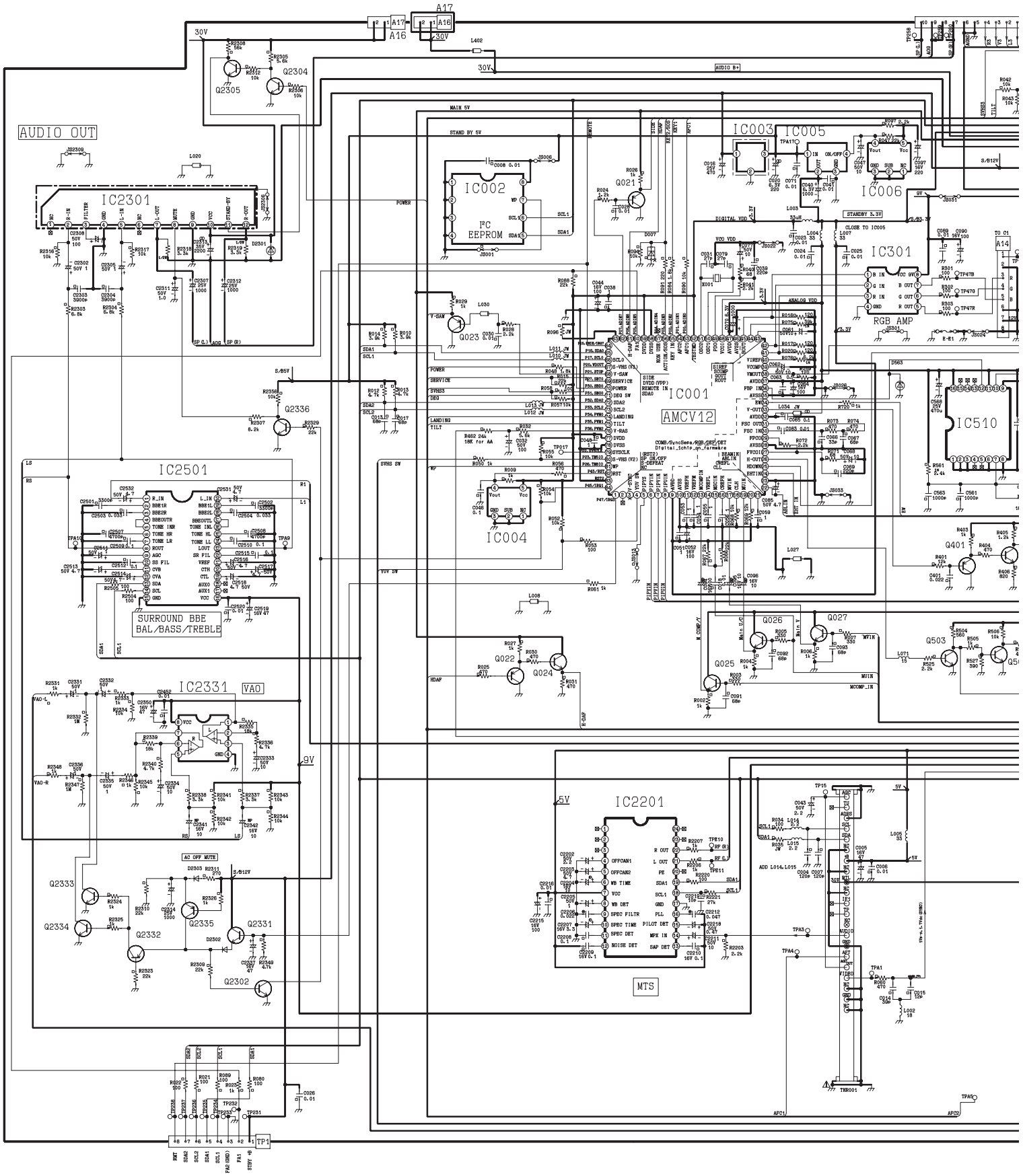
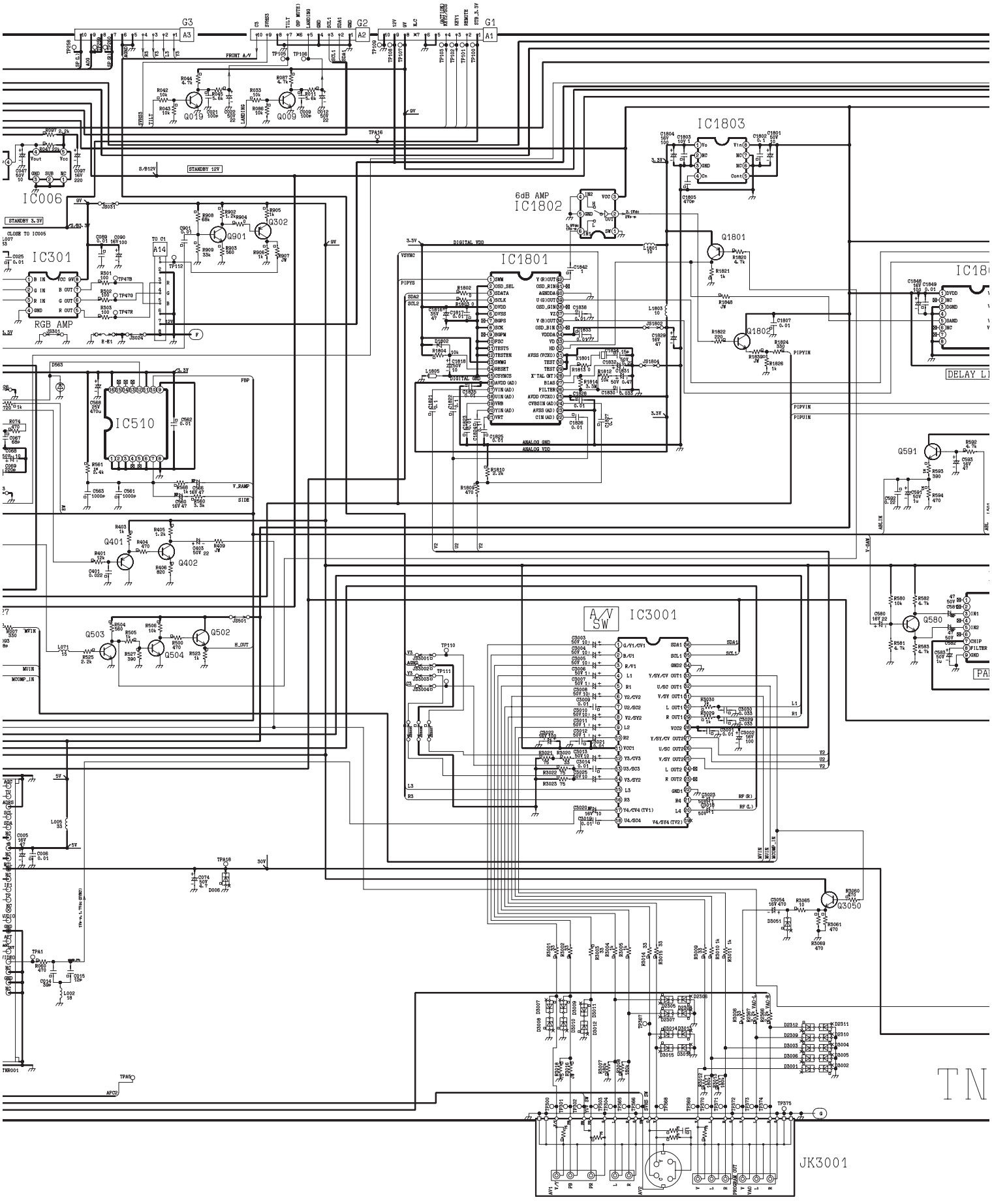

TNP2AH052
TEAMX5
94V-0
PbF

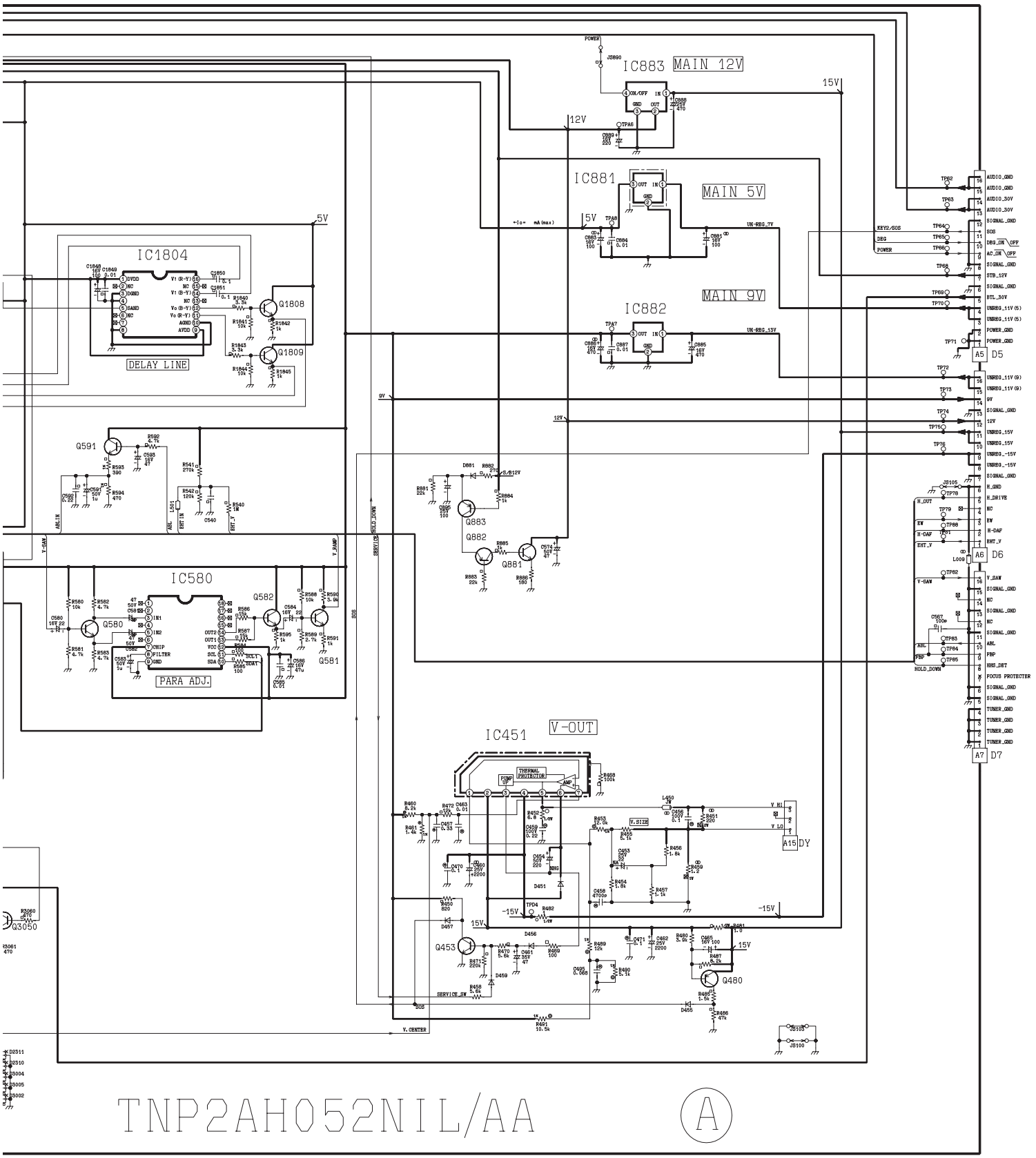

AUDIO OUT
IC2301
IC002
I²C EEPROM
IC003
IC005
IC006
IC301
RGB AMP
IC001
AMCV12
IC004
IC510
IC2501
SURROUND BBE
BAL/BASS/TREBLE
IC2331
VAO
IC2201
MTS
Q401
Q503
Q2302
Q2331
Q2332
Q2333
Q2334
Q2335
Q021
Q022
Q023
Q024
Q025
Q026
Q027
Q2304
Q2305
Q2336
TNR001
AUDIO B+
MAIN 5V
STAND BY 5V
DIGITAL VDD 3.3V
ANALOG VDD
STANDBY 3.3V
S/B12V
S/B5V
9V
5V
30V

1	2	3	4	5	6	7	8

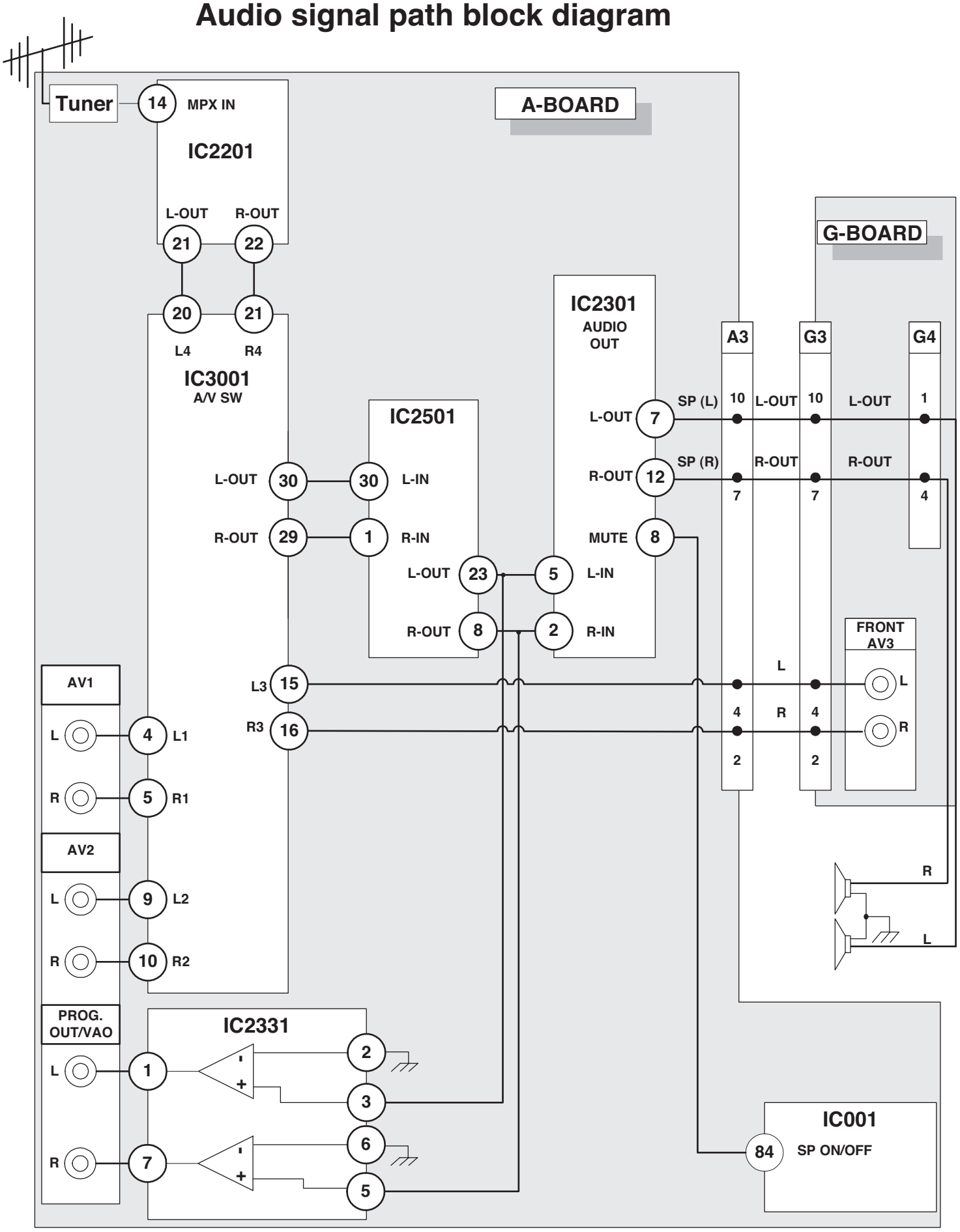


1	2	3	4	5	6	7	8

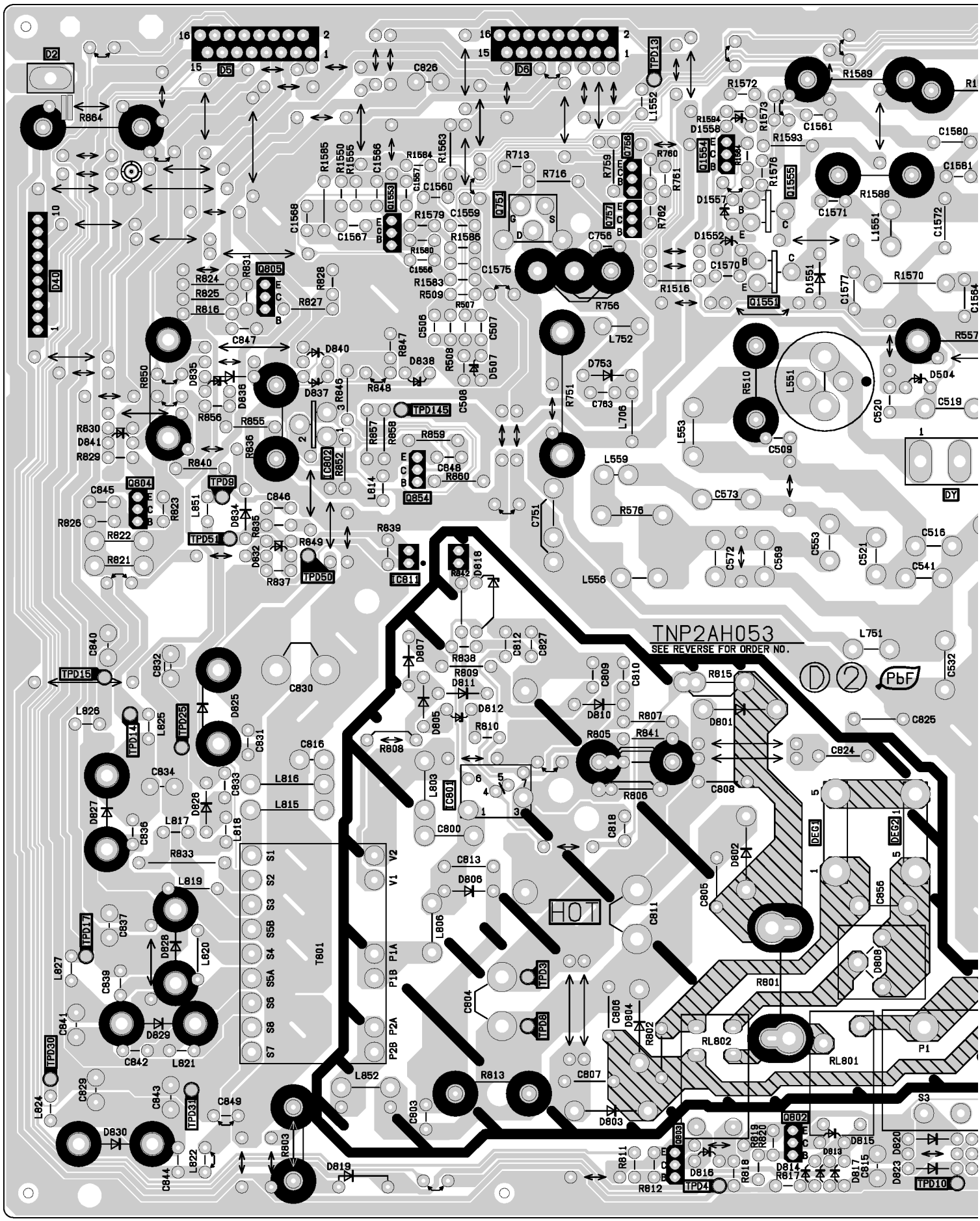
A-BOARD 2 OF 3 TNP2AH052NIL/AA CT-36SL13G, CT-32SL13G, CT-36SC13G, CT-32SC13G, CT-3653G


IC883 MAIN 12V
IC881 MAIN 5V
IC882 MAIN 9V
IC1804
DELAY LINE
IC580
PARA ADJ.
IC451 V-OUT
TNP2AH052NIL/AA
A

Audio signal path block diagram

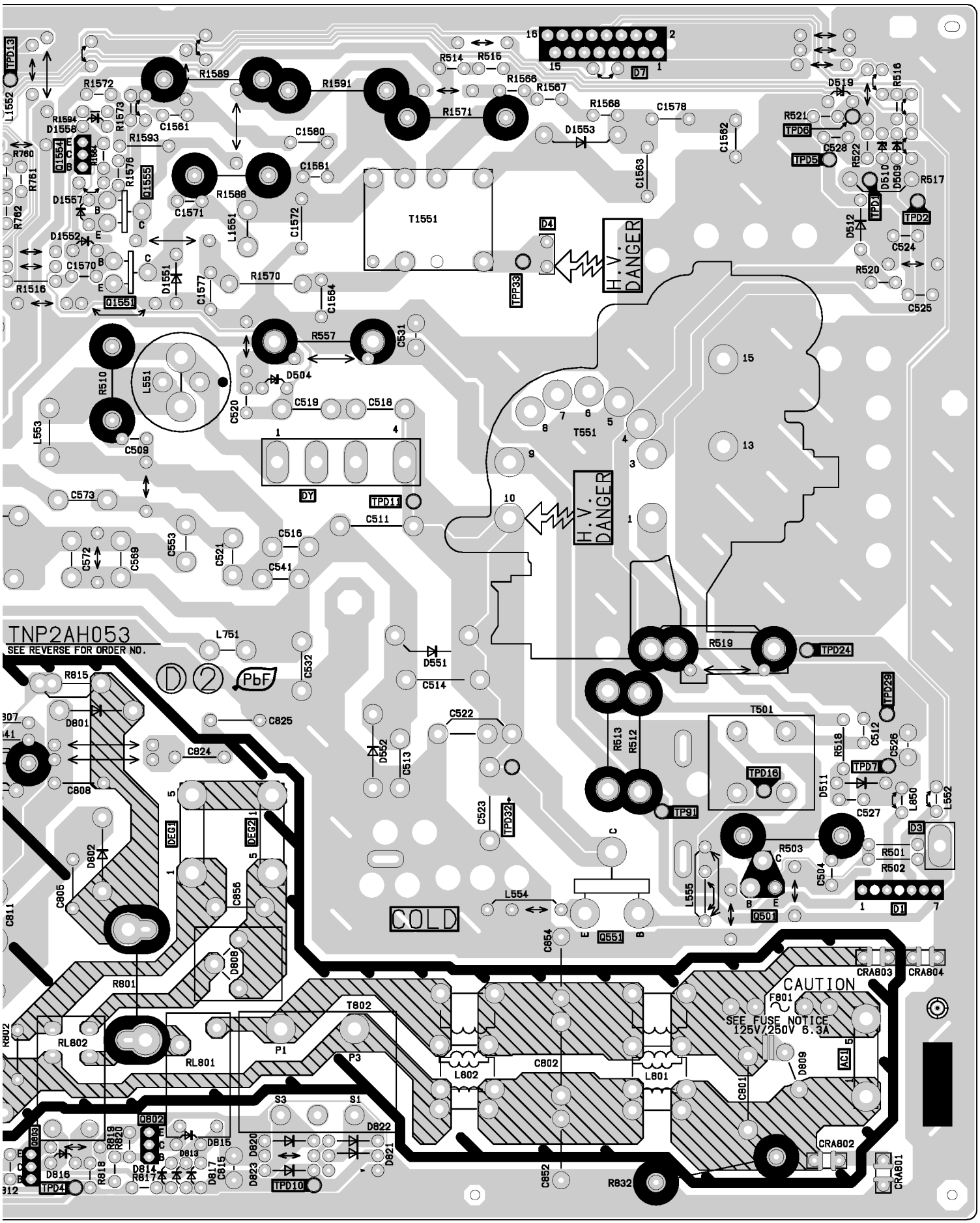


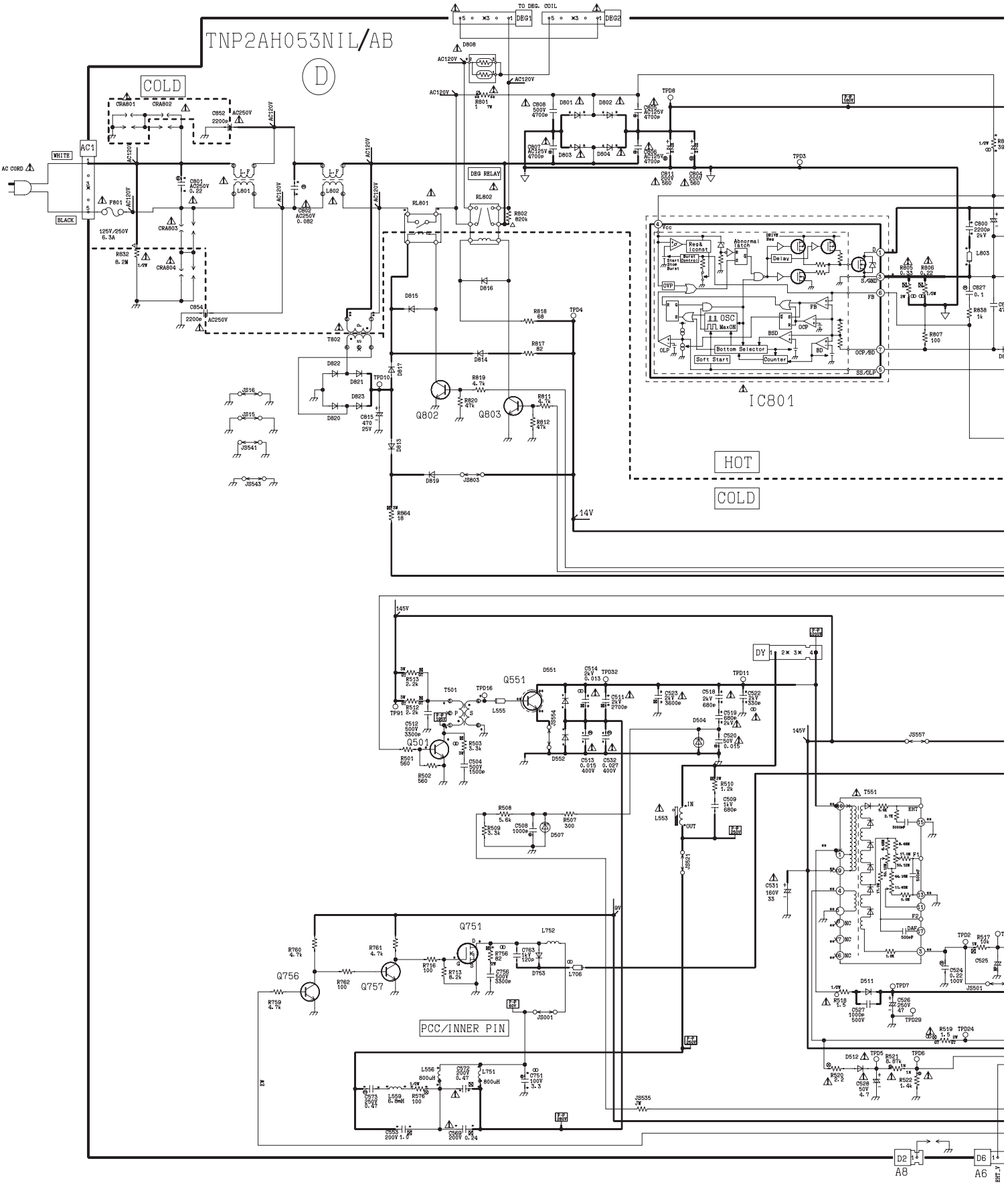
AUDIO BLOCK DIAGRAM CT-36SL13G, CT-32SL13G, CT-36SC13G, CT-32SC13G, CT-3653G



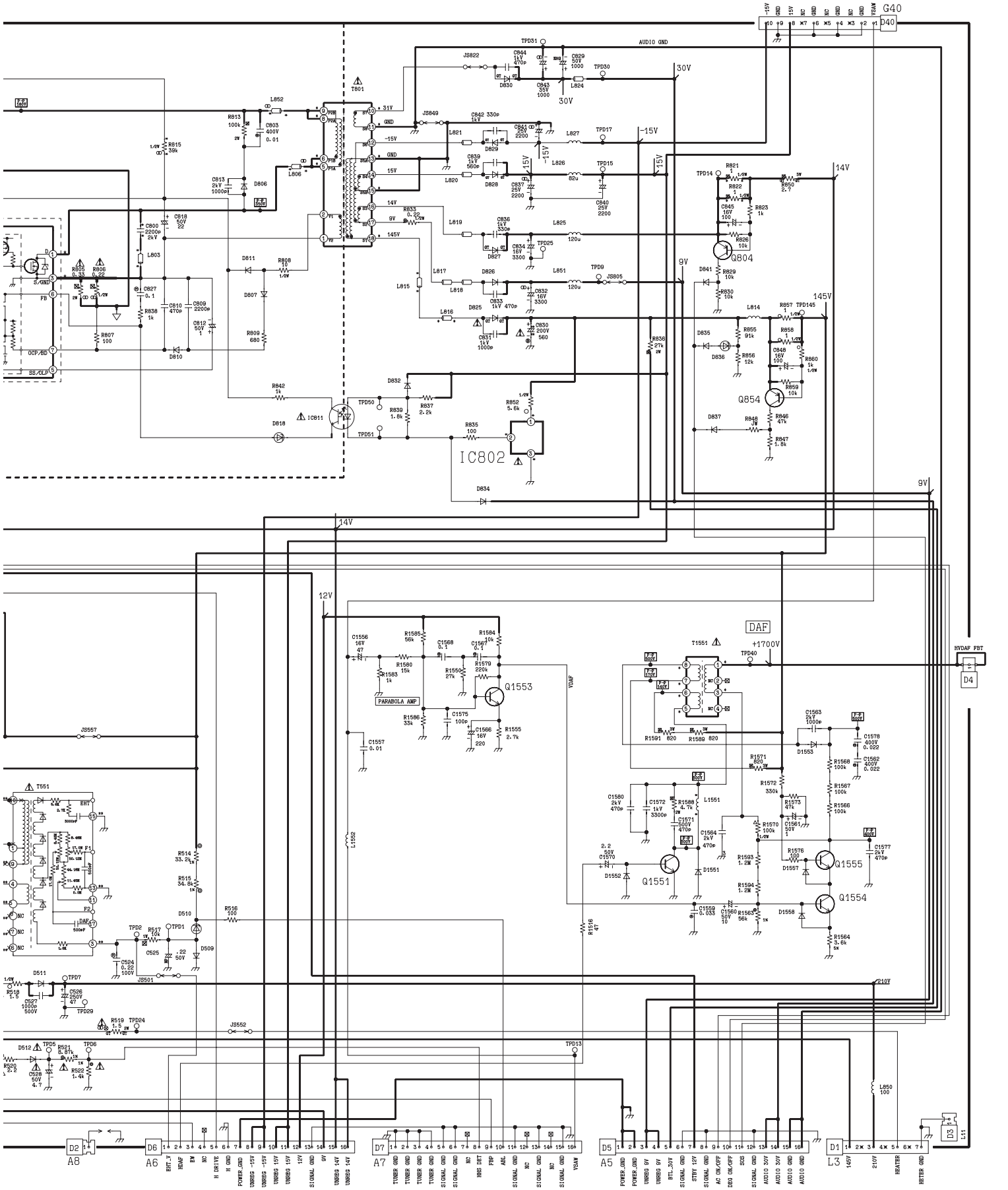
J I H G F E D C B A

1 2 3 4 5 6 7 8


TNP2AH053
SEE REVERSE FOR ORDER NO.
D2
PbF
H.V. DANGER
H.V. DANGER
COLD
CAUTION
SEE FUSE NOTICE
125V/250V 6.3A
T1551
T551
T501
DY
TPD13
TPD11
TPD24
TPD29
TPD16
TPD7
TPD91
TPD32
TPD33
TPD6
TPD5
TPD1
TPD2
TPD4
TPD10
D7
D1
D3
Q1551
Q1554
Q1555
Q802
Q803
Q501
Q551
CRA803
CRA804
CRA802
CRA801
F801
RL802
RL801
T802
L802
L801
C802
C801
C852
C854
R832
P1
P3
S3
S1
DEG1
DEG2
ACI

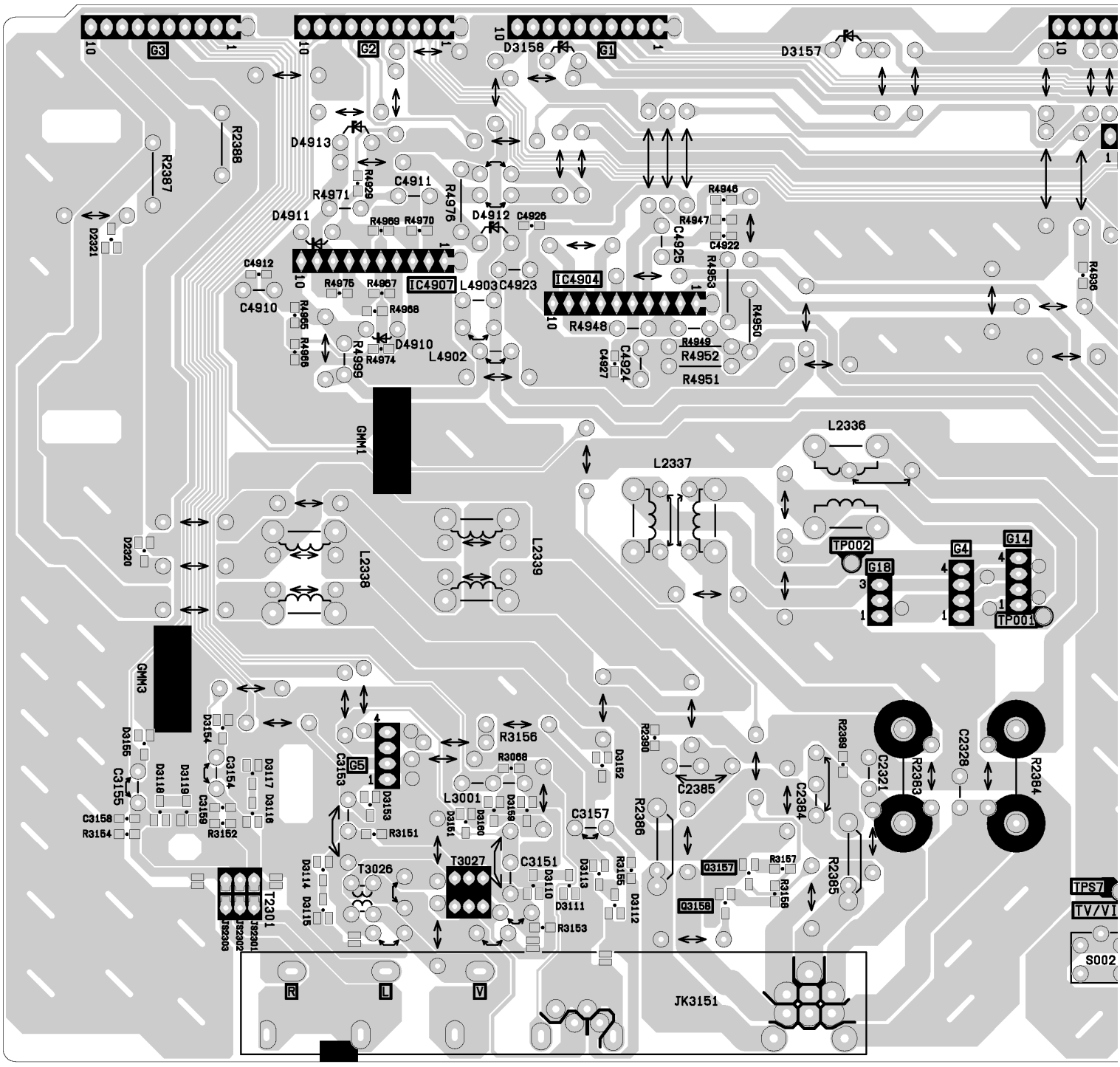

TNP2AH053NIL/AB
D
COLD
HOT
IC801
PCC/INNER PIN
TO DEG. COIL
DEG1
DEG2
DEG RELAY
AC CORD
WHITE
BLACK
AC1
F801
125V/250V 6.3A
RL801
RL802
T802
T501
T551
Q501
Q551
Q751
Q756
Q757
Q802
Q803
L553
L555
L556
L751
L752
L706
D507
D551
D552
D753
D511
D512
IC801
Vcc
Reg&Const
Abnormal latch
Delay
OVP
OSC
MaxON
Bottom Selector
Soft Start
Counter
OCP
BSD
BD
FB
S/GND
OCP/BD
SS/OLP
OLP
DY
EHT
14V
9V
145V
AC120V
AC250V
TPD1
TPD2
TPD3
TPD4
TPD5
TPD6
TPD7
TPD8
TPD10
TPD11
TPD16
TPD24
TPD29
JS501
JS521
JS535
JS541
JS543
JS557
JS803
JS901
D2
D6
A8
A6

1	2	3	4	5	6	7	8

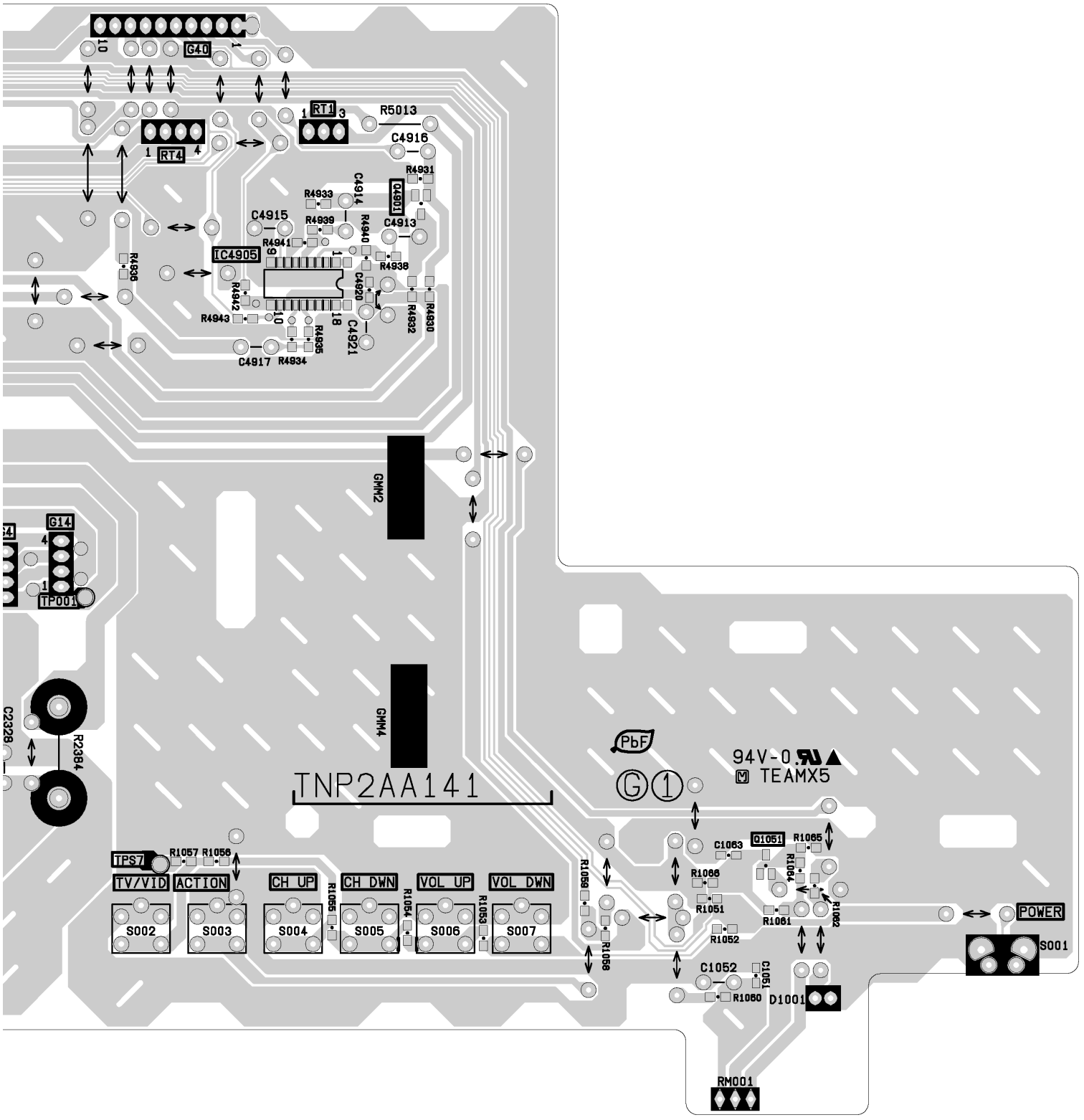


1	2	3	4	5	6	7	8

D-BOARD 2 OF 2 TNP2AH053NIL/AB CT-36SL13G, CT-32SL13G, CT-36SC13G, CT-32SC13G, CT-3653G

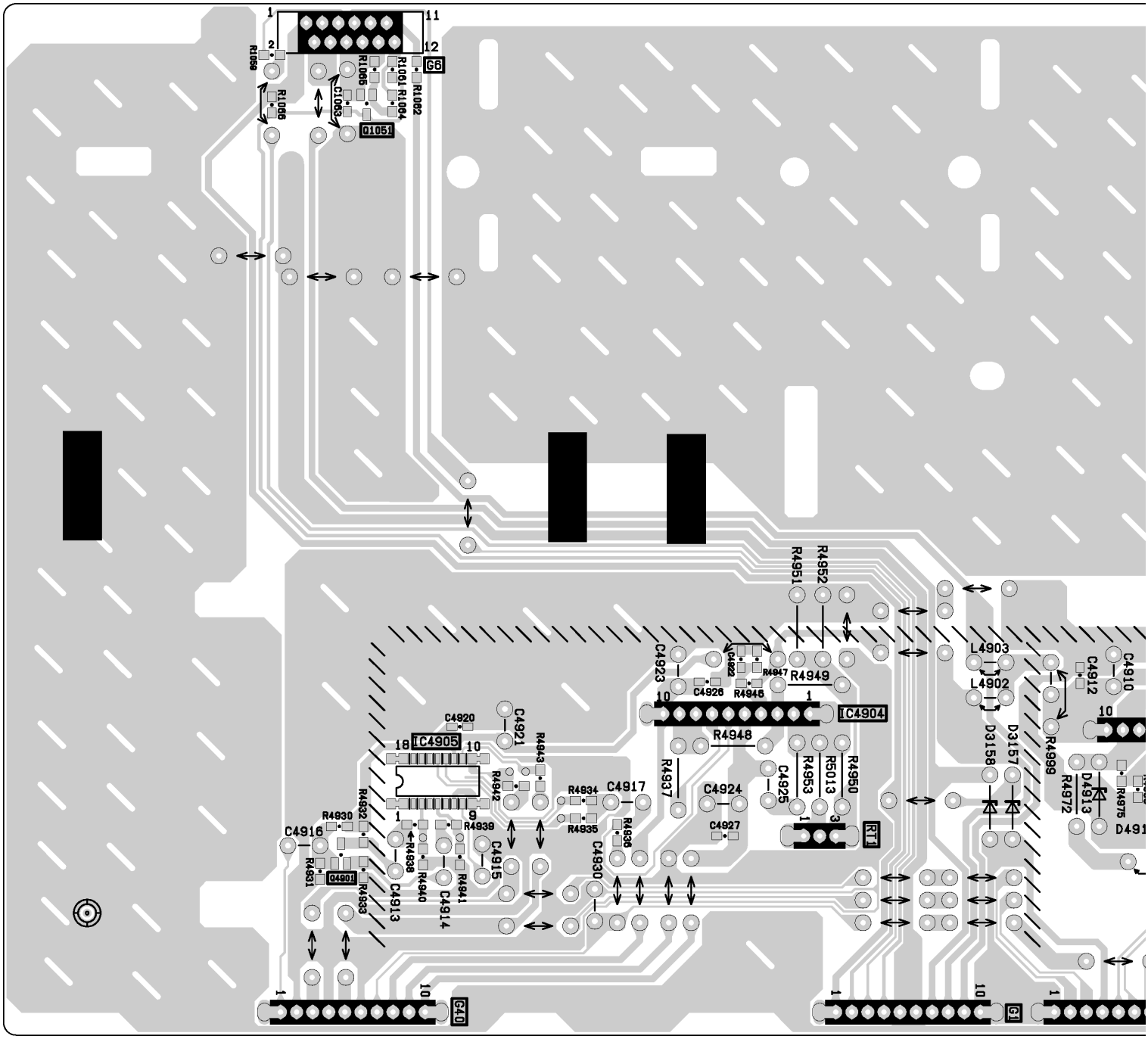

G3
G2
G1
D3158
D3157
R2388
R2387
D2321
D4913
R4929
C4911
R4971
R4976
D4911
R4969
R4970
D4912
C4926
C4912
C4910
R4975
R4967
IC4907
L4903
C4923
R4965
R4966
R4968
R4999
R4974
D4910
L4902
IC4904
R4948
R4946
R4947
C4925
C4922
R4953
R4950
R4949
R4952
R4951
C4927
C4924
R4936
GMM1
L2336
L2337
L2338
L2339
D2320
TP002
G18
G4
G14
TP001
GMM3
C3155
D3155
D3118
D3154
C3154
D3119
C3159
D3117
D3116
C3158
R3154
R3152
G5
C3153
D3153
R3156
R3068
L3001
D3161
D3158
D3160
C3157
R3151
T3026
T3027
C3151
D3110
D3114
D3115
D3111
R3153
D3113
R3155
D3112
D3152
R2390
C2385
R2386
Q3157
Q3158
R3157
R3158
R2385
C2384
R2389
C2321
R2383
C2328
R2384
T2301
J52303
J52302
J52301
TPS7
TV/V1
S002
R
L
V
JK3151

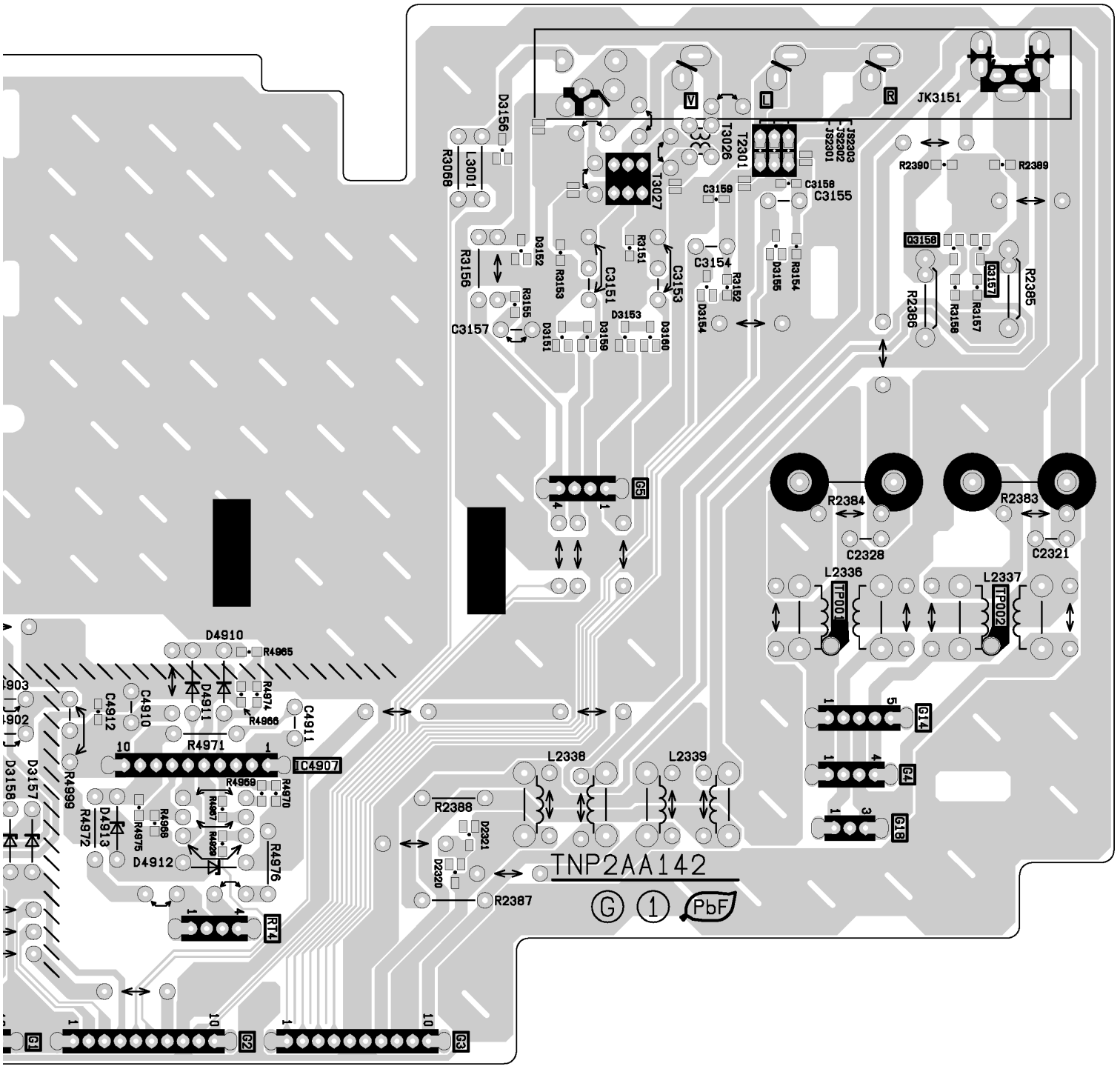
1	2	3	4	5	6	7	8



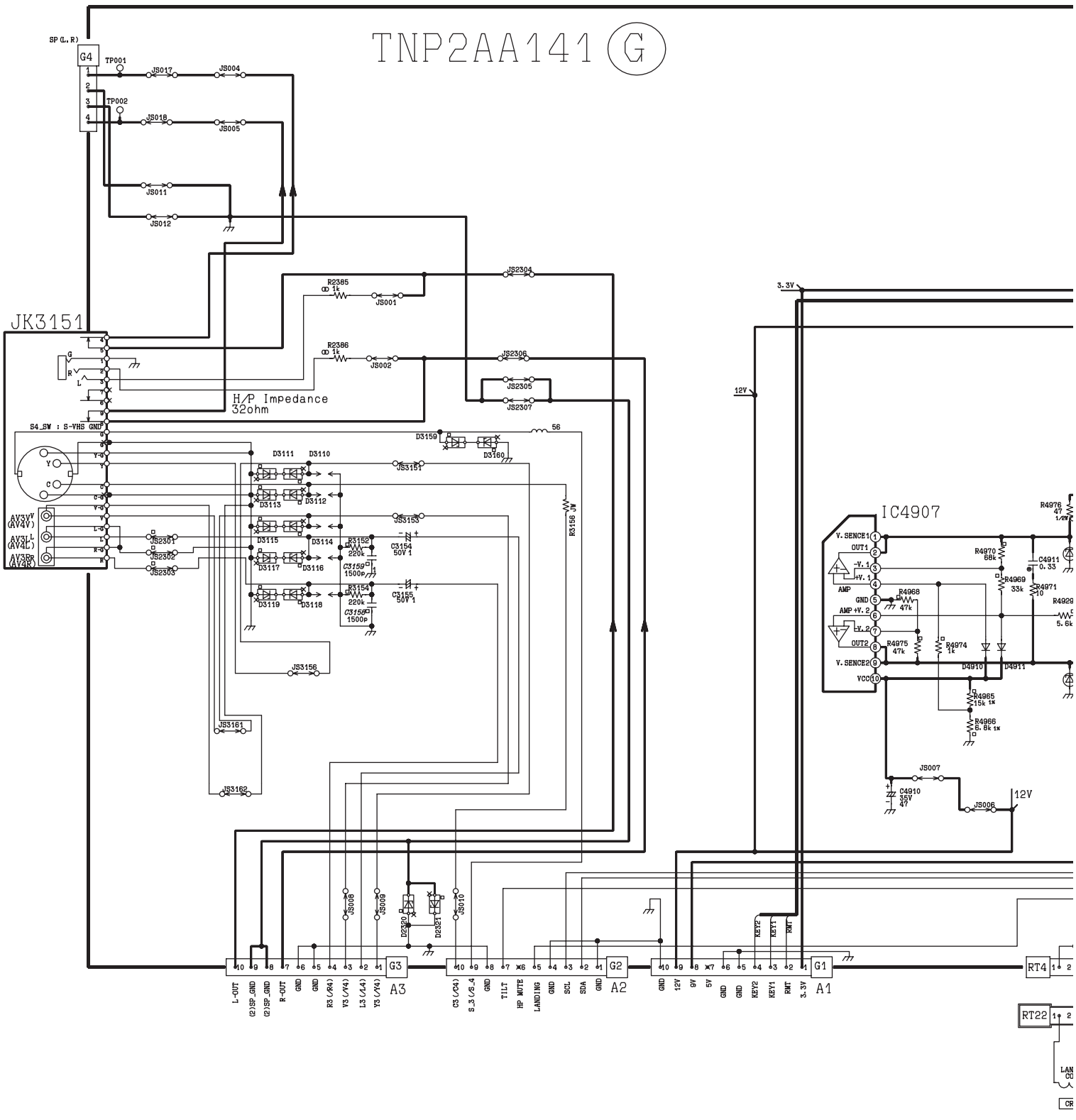
1	2	3	4	5	6	7	8

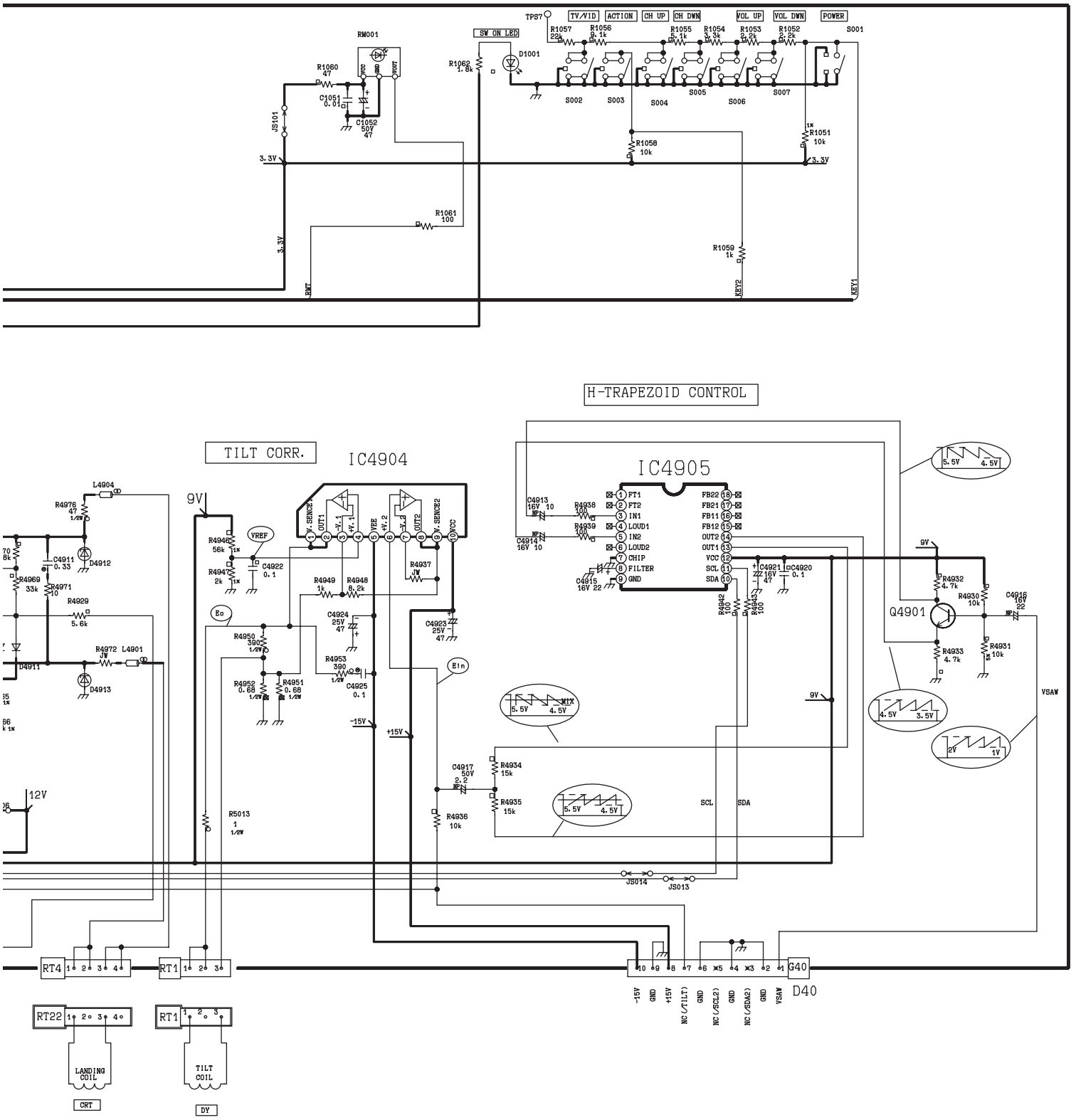
G-BOARD 2 OF 2 TNP2AA141 CT-36SC13G, CT-32SC13G, CT-3653G

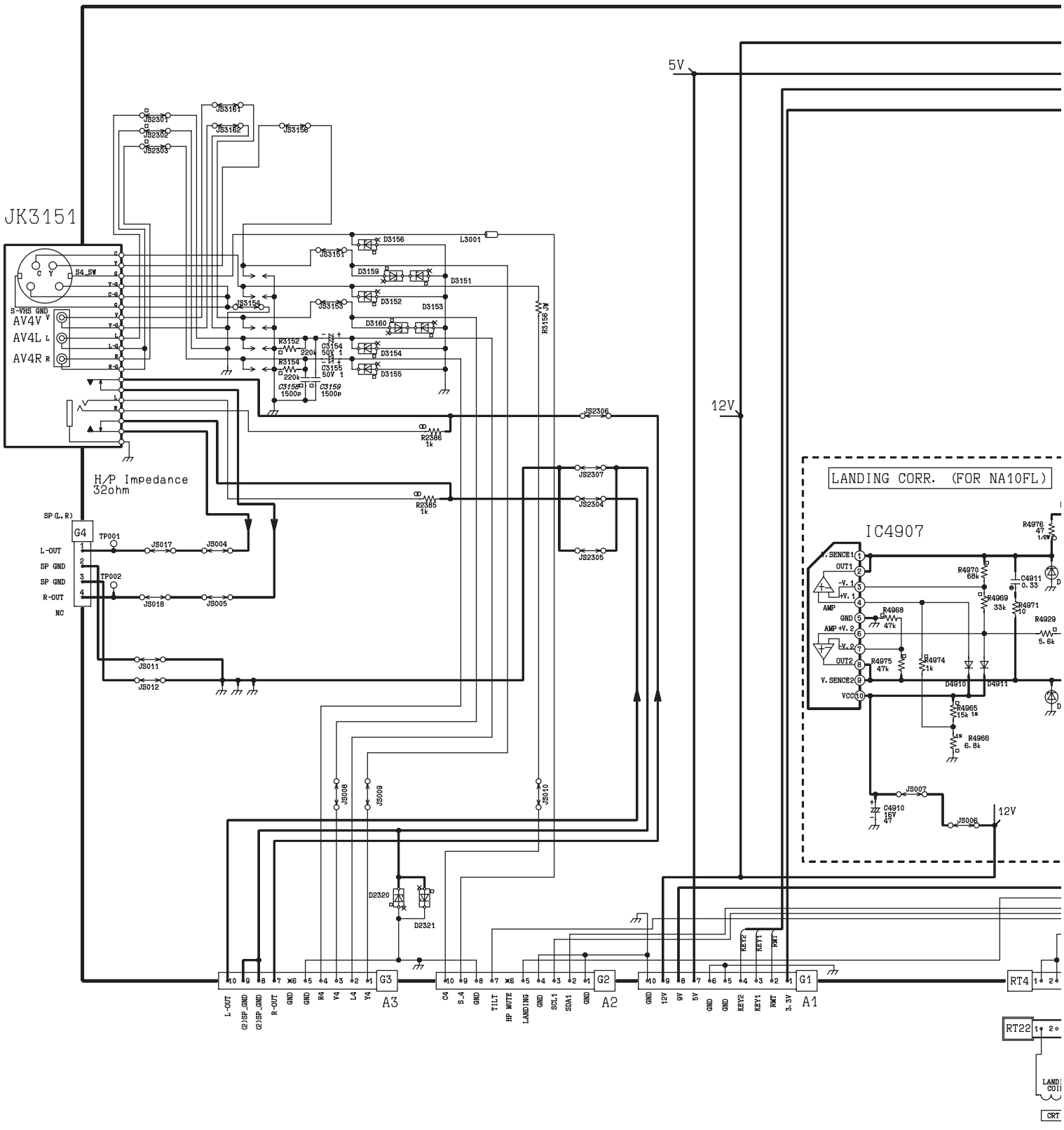

G6
Q1051
R1063
R1065
R1066
R1061
R1064
R1062
R1059
R4951
R4952
C4923
C4922
R4947
R4949
C4926
R4945
IC4904
L4903
L4902
C4912
C4910
R4948
R4937
C4924
C4925
R4953
R5013
R4950
C4927
RT1
D3158
D3157
R4999
R4972
D4913
R4975
C4920
IC4905
C4921
R4943
R4942
R4939
R4934
C4917
R4935
R4936
R4930
R4932
C4916
R4931
Q4901
R4933
R4938
R4940
C4913
C4914
C4915
C4930
G40
G1

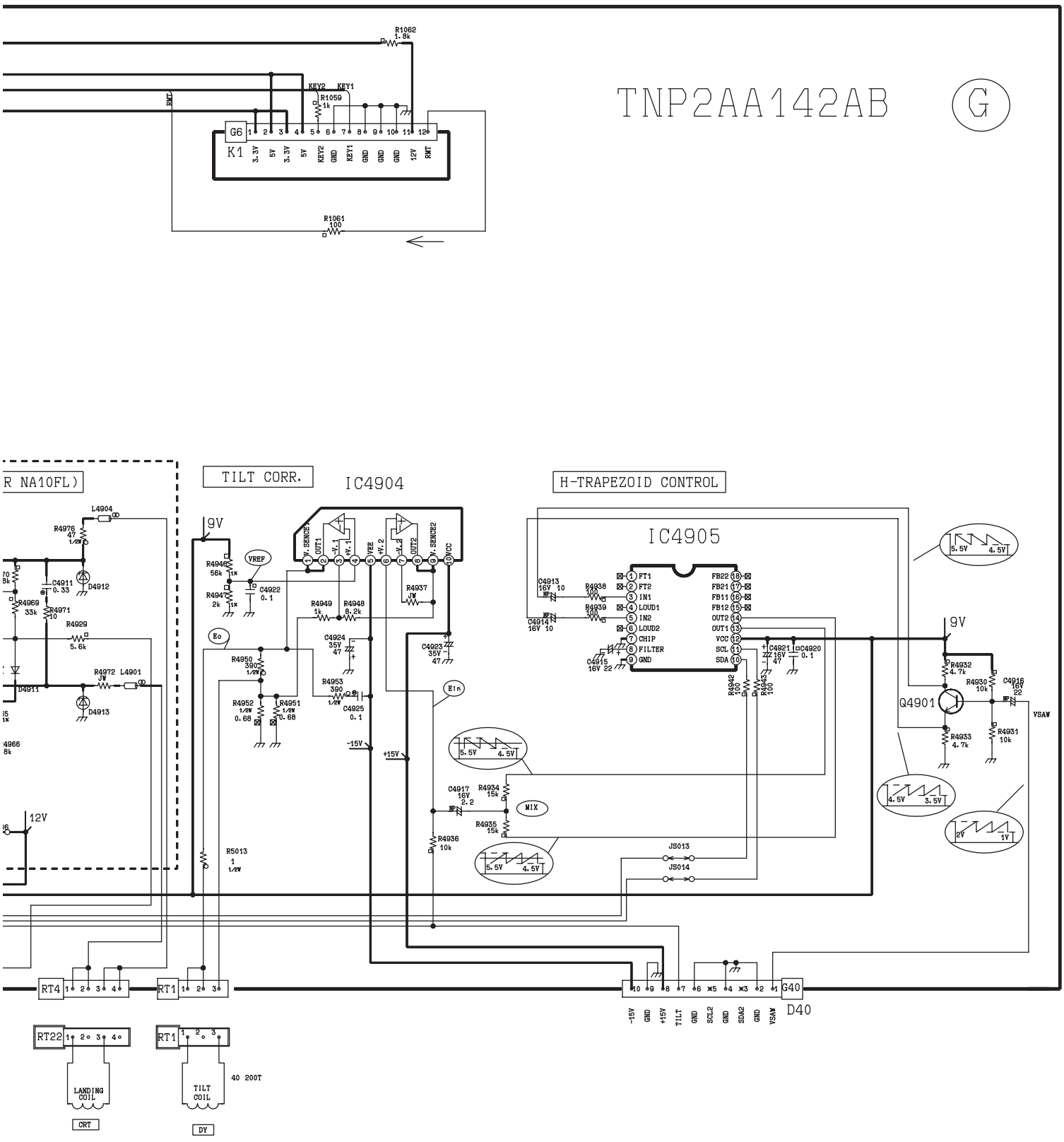

JK3151
V
L
R
T3026
T3027
T2301
JS2303
JS2302
JS2301
D3156
L3001
R3068
C3159
C3158
C3155
R2390
R2389
Q3158
Q3157
R2385
R2386
R3158
R3157
R3156
D3152
R3153
C3151
R3151
C3153
C3154
R3152
D3155
R3154
C3157
R3155
D3153
D3151
D3159
D3160
D3154
G5
R2384
R2383
C2328
C2321
L2336
L2337
TP001
TP002
D4910
R4965
D4911
R4974
R4966
C4911
C4912
C4910
R4971
IC4907
R4969
R4970
R4967
R4968
R4975
R4973
D4913
D4912
R4976
R4999
R4972
D3158
D3157
L2338
L2339
R2388
D2321
D2320
R2387
TNP2AA142
G
1
PbF
G14
G4
G16
RT4
G1
G2
G3

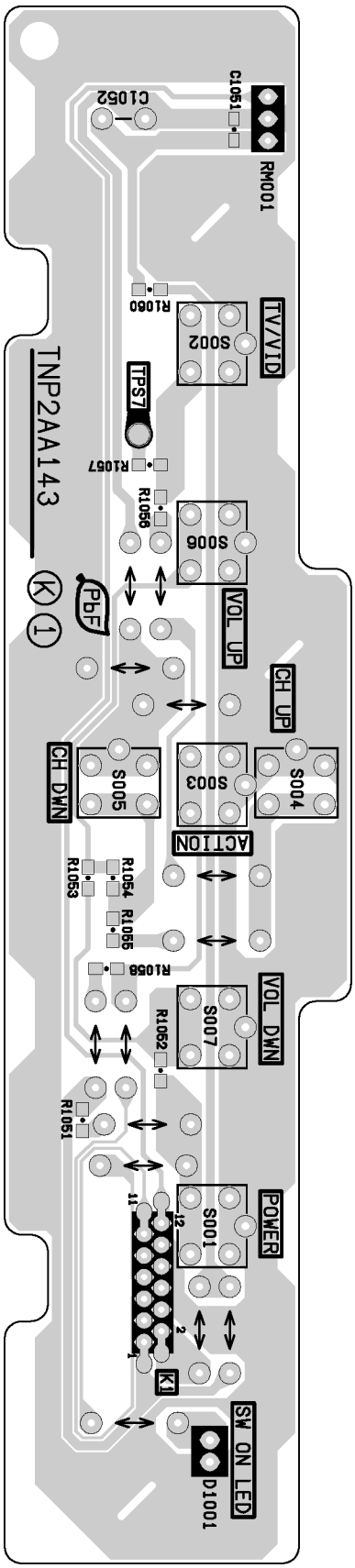
1	2	3	4	5	6	7	8


TNP2AA141 G
JK3151
H/P Impedance
32ohm
S4_SW : S-VHS GND
IC4907
3.3V
12V
G4
G3
G2
G1
A3
A2
A1
RT4
RT22


TPS7
TV/VID
ACTION
CH UP
CH DWN
VOL UP
VOL DWN
POWER
SW ON LED
RM001
D1001
S001
S002
S003
S004
S005
S006
S007
JS101
3.3V
KEY1
KEY2
H-TRAPEZOID CONTROL
TILT CORR.
IC4904
IC4905
L4904
9V
12V
VREF
Eo
Ein
-15V
+15V
Q4901
VSAW
SCL
SDA
JS014
JS013
RT4
RT1
RT22
G40
D40
LANDING COIL
TILT COIL
CRT
DY

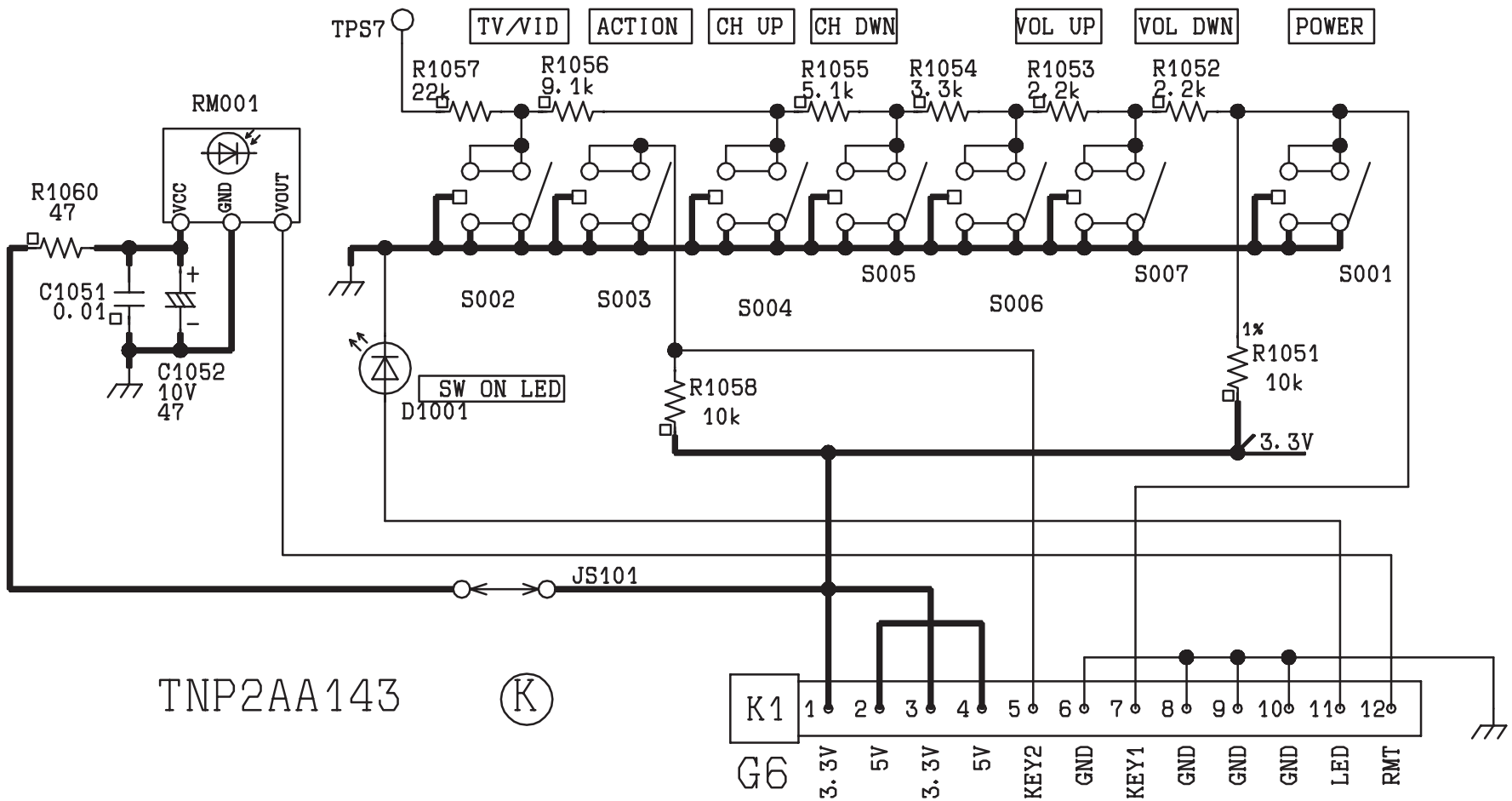

JK3151
S-VHS GND
AV4V
AV4L
AV4R
H/P Impedance
32ohm
SP (L, R)
L-OUT
SP GND
SP GND
R-OUT
NC
5V
12V
LANDING CORR. (FOR NA10FL)
IC4907
A3
A2
A1
CRT

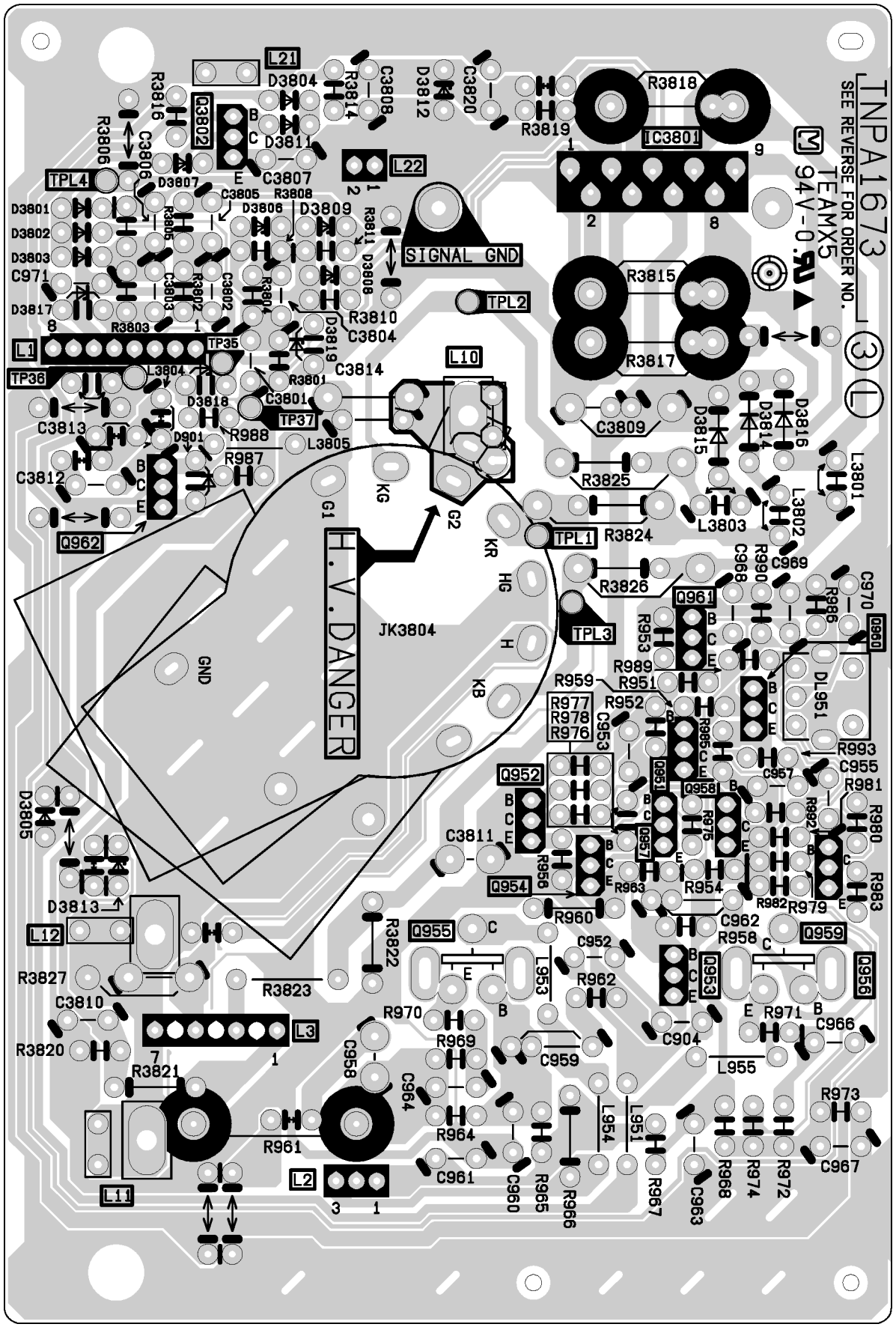

TNP2AA142AB
G
R1062
1.8k
KEY2
KEY1
R1059
1k
RMT
G6
K1
3.3V
5V
3.3V
5V
KEY2
GND
KEY1
GND
GND
12V
RMT
R1061
100
TILT CORR.
IC4904
H-TRAPEZOID CONTROL
IC4905
9V
VREF
Eo
Ein
-15V
+15V
12V
MIX
L4904
R4976
47
1/2W
D4912
C4911
0.33
R4969
33k
R4971
10
R4929
5.6k
D4911
R4972
JW
L4901
D4913
R4966
8k
R4940
56k
1%
R4941
2k
1%
C4922
0.1
R4949
1k
R4948
8.2k
R4937
JW
C4924
35V
47
C4923
35V
47
R4950
390
1/2W
R4953
390
1/2W
R4952
1/2W
0.68
R4951
1/2W
0.68
C4925
0.1
R5013
1
1/2W
C4913
16V 10
NP
C4914
16V 10
NP
R4938
100
R4939
100
C4915
16V 22
R4942
100
R4943
100
C4921
16V
47
C4920
0.1
FT1
FT2
IN1
LOUD1
IN2
LOUD2
CHIP
FILTER
GND
FB22
FB21
FB11
FB12
OUT2
OUT1
VCC
SCL
SDA
5.5V
4.5V
C4917
16V
2.2
NP
R4934
15k
R4935
15k
R4936
10k
3.5V
2V
1V
JS013
JS014
Q4901
R4932
4.7k
R4930
10k
C4916
16V
22
NP
R4933
4.7k
R4931
10k
VSAW
RT4
RT1
RT22
G40
D40
-15V
GND
+15V
TILT
GND
SCL2
GND
SDA2
GND
VSAW
LANDING
COIL
CRT
TILT
COIL
40 200T
DY



1	2	3	4	5	6	7	8

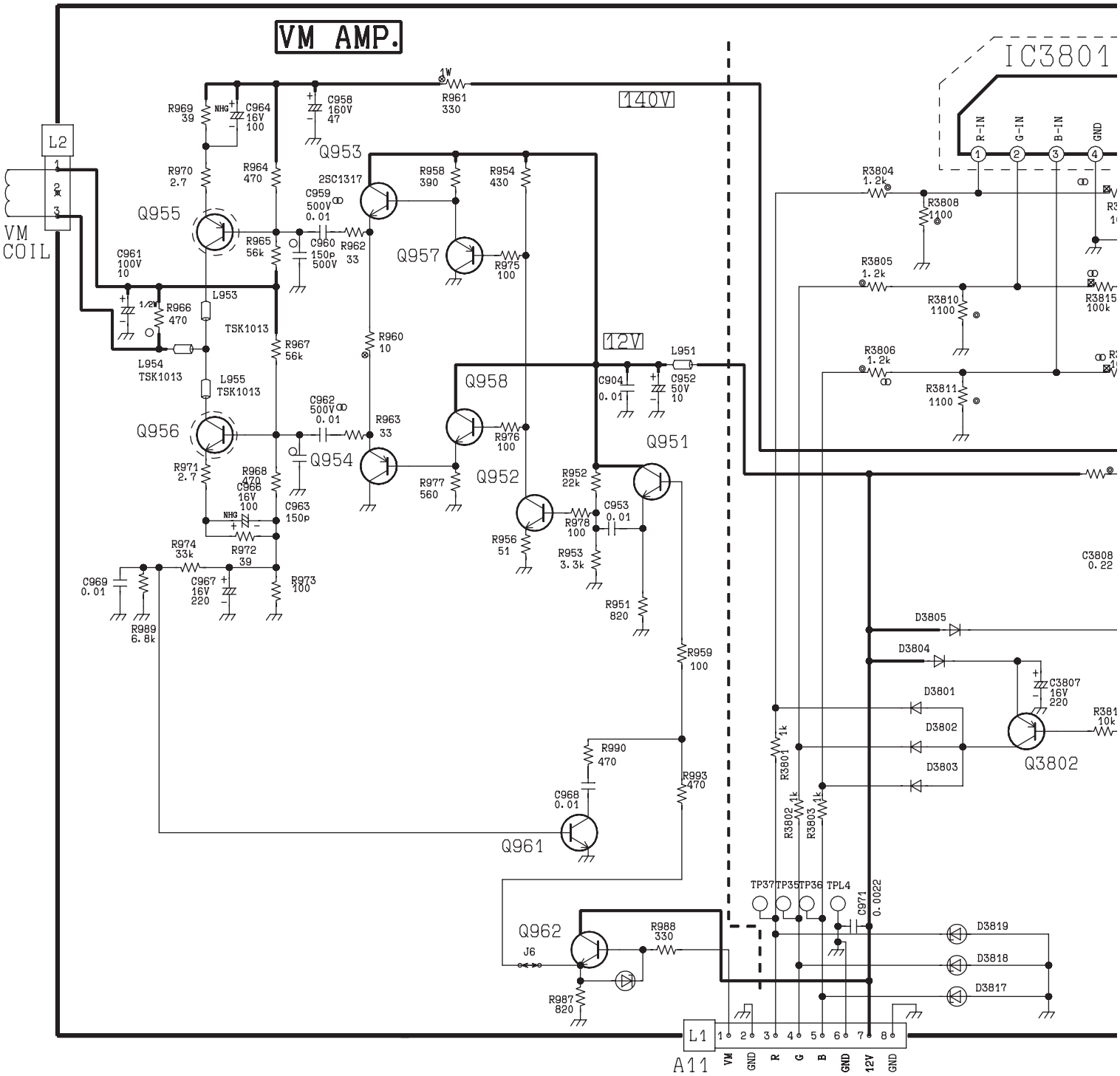
K-BOARD TNP2AA143 CT-36SL13G, CT-32SL13G, CT-36SC13G, CT-32SC13G, CT-3653G


TPS7
TV/VID
ACTION
CH UP
CH DWN
VOL UP
VOL DWN
POWER
R1057 22k
R1056 9.1k
R1055 5.1k
R1054 3.3k
R1053 2.2k
R1052 2.2k
RM001
VCC
GND
VOUT
R1060 47
C1051 0.01
C1052 10V 47
S002
S003
S004
S005
S006
S007
S001
SW ON LED
D1001
R1058 10k
1%
R1051 10k
3.3V
JS101
TNP2AA143
K
K1
G6
1 2 3 4 5 6 7 8 9 10 11 12
3.3V
5V
3.3V
5V
KEY2
GND
KEY1
GND
GND
GND
LED
RMT

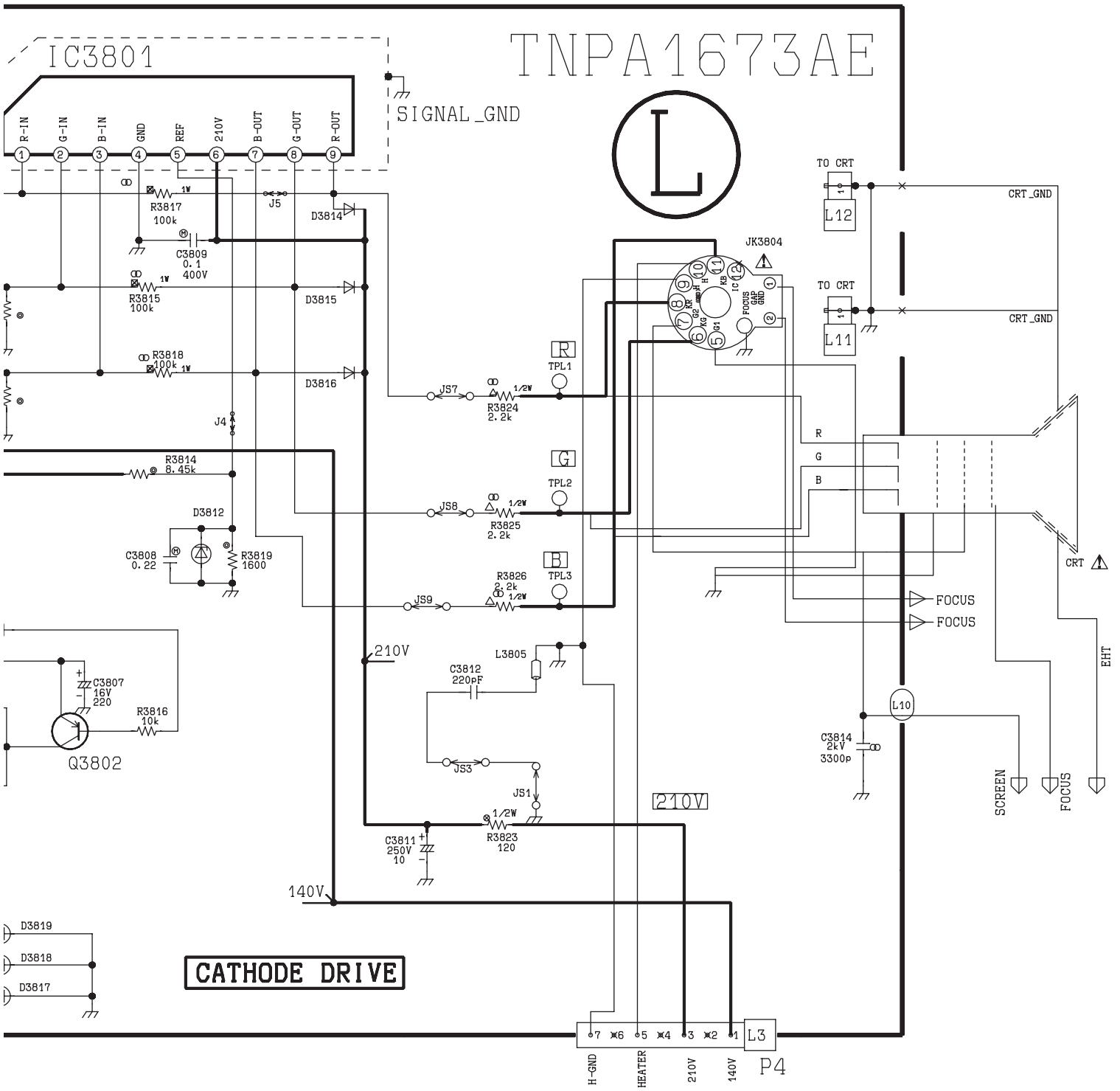


1	2	3	4	5	6	7	8

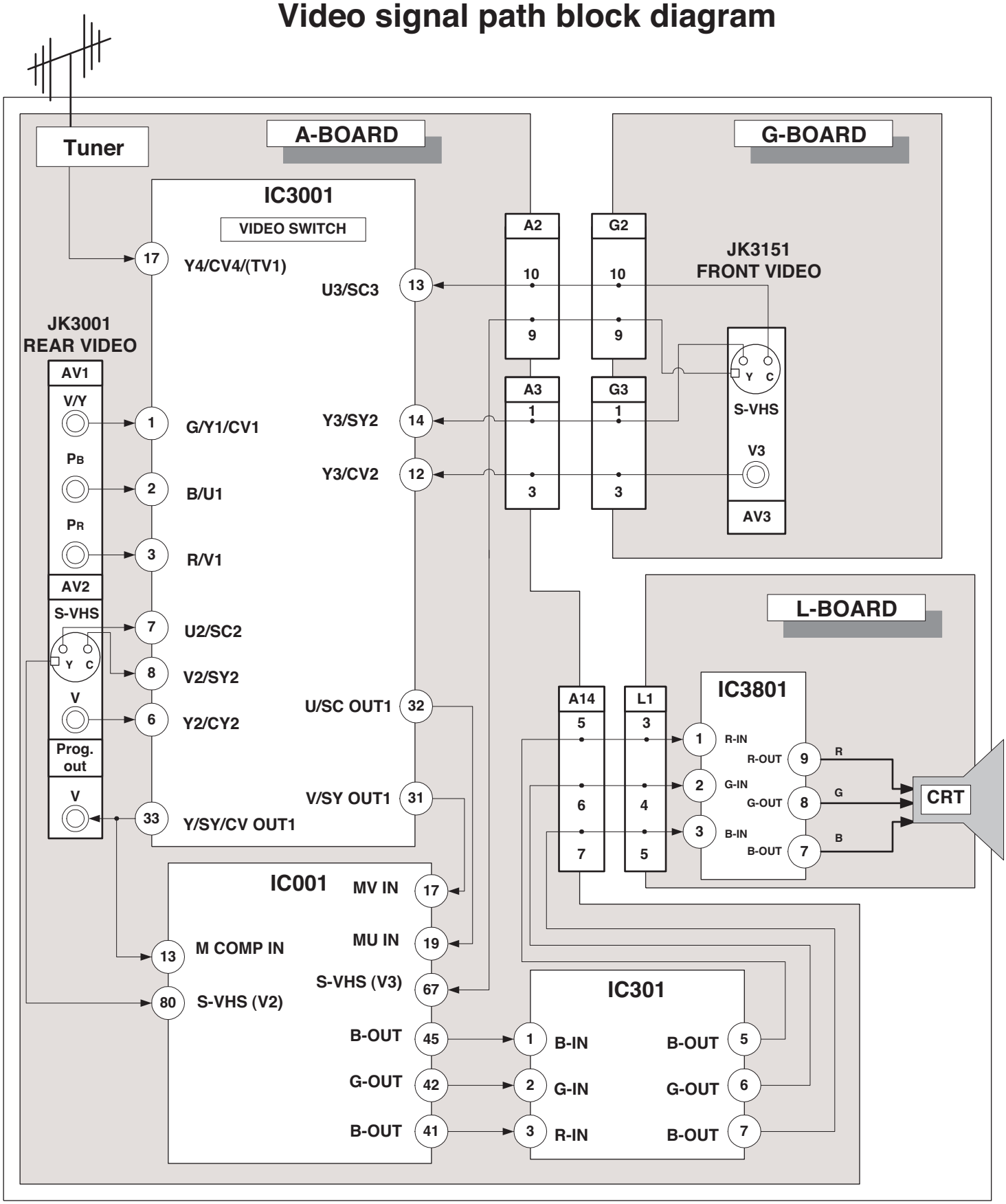
L-BOARD TNPA1673 CT-36SL13G, CT-32SL13G, CT-36SC13G, CT-32SC13G, CT-3653G


VM AMP.
IC3801
140V
12V
L2
VM COIL
L1
A11
Q953
Q955
Q957
Q956
Q954
Q958
Q952
Q951
Q961
Q962
Q3802
2SC1317
TSK1013
R961 330
R969 39
R970 2.7
R964 470
R965 56k
R966 470
R967 56k
R968 470
R971 2.7
R972 39
R973 100
R974 33k
R975 100
R976 100
R977 560
R978 100
R952 22k
R953 3.3k
R956 51
R951 820
R959 100
R960 10
R962 33
R963 33
R958 390
R954 430
R988 330
R987 820
R989 6.8k
R990 470
R993 470
R3804 1.2k
R3808 1100
R3805 1.2k
R3810 1100
R3806 1.2k
R3811 1100
R3815 100k
R3801 1k
R3802 1k
R3803 1k
C964 16V 100
C958 160V 47
C959 500V 0.01
C960 150p 500V
C961 100V 10
C962 500V 0.01
C963 150p
C966 16V 100
C967 16V 220
C969 0.01
C968 0.01
C904 0.01
C952 50V 10
C953 0.01
C971 0.0022
C3807 16V 220
C3808 0.22
D3805
D3804
D3801
D3802
D3803
D3819
D3818
D3817
TP37 TP35 TP36 TPL4
R-IN
G-IN
B-IN
GND
VM
GND
R
G
B
GND
12V
GND

1	2	3	4	5	6	7	8


TNPA1673AE
L
IC3801
R-IN
G-IN
B-IN
GND
REF
210V
B-OUT
G-OUT
R-OUT
SIGNAL_GND
R3817 100k
C3809 0.1 400V
R3815 100k
R3818 100k
D3814
D3815
D3816
J5
J4
R3814 8.45k
D3812
C3808 0.22
R3819 1600
C3807 16V 220
R3816 10k
Q3802
D3819
D3818
D3817
CATHODE DRIVE
210V
140V
L3805
C3812 220pF
JS3
JS1
R3823 120
C3811 250V 10
JS7
R3824 2.2k
JS8
R3825 2.2k
JS9
R3826 2.2k
TPL1
TPL2
TPL3
R
G
B
JK3804
TO CRT
L12
L11
CRT_GND
CRT
FOCUS
L10
C3814 2kV 3300p
EHT
SCREEN
P4
H-GND
HEATER

Video signal path block diagram



A - BOARD - TNP2AH052/AA

IC001

1	0.00	43	2.40
2	1.10	44	1.60
3	0.00	45	0.20
4	0.00	46	0.00
5	0.00	47	3.20
6	1.10	48	1.60
7	1.20	49	1.60
8	1.30	50	1.60
9	3.00	51	1.70
10	0.00	52	3.20
11	2.40	53	1.60
12	1.40	54	1.00
13	1.30	55	3.30
14	0.60	56	1.40
15	1.60	57	0.00
16	2.40	58	0.00
17	1.40	59	3.30
18	1.60	60	3.30
19	1.10	61	0.90
20	1.50	62	0.10
21	0.60	63	3.30
22	2.60	64	3.30
23	0.00	65	2.60
24	1.30	66	2.90
25	2.80	67	3.20
26	0.70	68	0.80
27	1.50	69	0.00
28	0.00	70	0.00
29	1.50	71	3.10
30	1.70	72	5.00
31	1.00	73	5.00
32	3.20	74	1.90
33	2.40	75	1.70
34	2.70	76	2.40
35	0.00	77	3.20
36	2.80	78	0.00
37	3.20	79	1.60
38	0.50	80	3.30
39	2.10	81	1.20
40	1.60	82	3.20
41	0.20	83	0.00
42	0.20	84	3.20

IC002

1	0.00
2	0.00
3	0.00
4	0.00
5	2.60
6	2.80
7	0.00
8	5.00

IC003

1	8.20
2	0.00
3	5.20

IC004

1	0.00
2	0.00
3	0.00
4	3.30
5	3.30

IC005

1	5.00
2	3.30
3	0.00
4	5.00

IC006

1	0.00
2	0.00
3	0.00
4	5.00
5	5.00

IC2201

1	0.00	13	2.80
2	0.00	14	2.10
3	0.00	15	2.90
4	2.30	16	3.50
5	2.30	17	0.00
6	0.07	18	2.80
7	5.00	19	2.60
8	2.40	20	0.00
9	2.50	21	2.20
10	0.80	22	2.20
11	2.20	23	0.00
12	2.50	24	0.00

IC2301

1	0.00
2	0.00
3	31.40
4	0.00
5	0.00
6	0.00
7	15.70
8	0.60
9	0.00
10	32.70
11	12.20
12	15.60

IC2331

1	4.50
2	4.50
3	4.50
4	0.00
5	4.50
6	4.50
7	4.50
8	8.90

IC2501

1	4.40	16	8.90
2	4.50	17	0.00
3	4.50	18	0.00
4	4.40	19	3.90
5	4.50	20	3.80
6	4.50	21	4.40
7	4.50	22	4.40
8	4.40	23	4.40
9	1.50	24	4.40
10	4.50	25	4.40
11	1.60	26	4.40
12	1.60	27	4.40
13	2.60	28	4.40
14	2.90	29	4.40
15	0.00	30	4.40

IC3001

1	4.40	19	4.50
2	4.40	20	4.70
3	4.40	21	4.70
4	4.70	22	0.00
5	4.60	23	4.70
6	4.60	24	4.70
7	4.50	25	4.40
8	4.70	26	4.40
9	4.70	27	4.70
10	4.60	28	8.90
11	2.20	29	4.70
12	4.70	30	4.70
13	4.70	31	4.40
14	4.50	32	4.40
15	4.70	33	4.40
16	4.70	34	0.00
17	4.50	35	2.90
18	4.50	36	2.60

IC301

1	0.20
2	0.20
3	0.20
4	0.00
5	2.70
6	2.50
7	2.70
8	8.90

IC451

1	1.40
2	14.60
3	-12.40
4	-14.40
5	0.00
6	14.70
7	1.40

IC510

1	0.00	9	0.00
2	0.00	10	0.20
3	3.20	11	3.20
4	0.00	12	2.80
5	0.00	13	0.00
6	0.00	14	0.00
7	3.00	15	3.20
8	0.00	16	3.20

IC580

1	0.00	10	0.00
2	0.00	11	0.20
3	3.20	12	3.20
4	0.00	13	2.80
5	0.00	14	0.00
6	0.00	15	0.00
7	3.00	16	3.20
8	0.00	17	3.20
9	0.00	18	3.20

A - BOARD - TNP2AH052/AA

	Q009	Q019	Q021	Q022	Q023	Q024	Q025	Q026	Q027
B	0.00	0.40	0.20	0.90	0.90	1.60	4.40	4.40	4.60
C	2.50	2.70	0.00	0.00	0.00	5.00	8.20	8.30	8.30
E	0.00	0.00	0.80	0.90	1.50	1.60	3.80	3.80	4.00

	Q2302	Q2304	Q2305	Q2331	Q2332	Q2333	Q2334	Q2335	Q2336
B	0.00	0.70	0.00	0.00	0.00	-1.00	-1.00	8.30	0.60
C	3.20	0.00	12.30	8.30	-1.20	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	2.00	0.00	0.00	0.00	7.60	0.00

	Q302	Q3050	Q401	Q402	Q453	Q480	Q502	Q503	Q504
B	4.70	4.40	2.60	3.30	0.70	14.70	1.80	0.40	0.40
C	3.60	18.90	0.00	5.00	0.00	0.00	5.00	2.00	1.80
E	5.30	3.70	3.30	2.70	0.00	14.70	1.60	0.00	0.00

	Q580	Q581	Q582	Q591	Q881	Q882	Q883	Q901
B	2.80	1.90	4.30	5.30	-1.00	0.00	8.30	2.60
C	6.70	4.00	8.90	8.90	11.90	-1.00	-1.00	4.70
E	2.30	1.30	3.70	4.60	0.00	-1.00	7.60	2.00

L - BOARD - TNPA1673AE

IC3801	
1	.....1.90
2	.....1.90
3	.....1.90
4	.....0.00
5	.....1.90
6	...208.00
7	...139.20
8	...143.50
9	...139.00

	Q3802	Q951	Q952	Q953	Q954	Q955
B	11.80	5.80	1.40	6.50	5.20	142.50
C	-0.70	0.00	5.80	11.90	0.00	72.40
E	11.80	6.50	0.73	5.90	5.80	0.40

	Q956	Q957	Q958	Q961	Q962
B	0.90	5.80	5.80	0.05	3.50
C	72.40	0.00	11.90	0.00	11.90
E	0.40	6.50	5.20	0.00	2.90

D - BOARD - TNP2AH053NIL/AB

IC801↓	
1	-37.60
2	.N/C
3	0.10
4	20.00
5	0.20
6	1.20
7	1.10

IC802	
1	13.00
2	11.00
3	00.00

IC811	
1	11.10
2	12.20

	Q1551	Q1553	Q1554	Q1555	Q501	Q551	Q751
B	-0.20	2.10	3.90	16.60	0.40	0.00	21.40
C	104.60	6.30	16.10	174.90	98.60	14.30	4.70
E	0.00	1.50	3.30	16.10	0.00	0.00	0.00

	Q756	Q757	Q802	Q803	Q804	Q854
B	0.60	0.00	0.70	0.00	14.80	144.10
C	0.10	4.80	0.10	13.70	00.00	00.00
E	0.00	0.00	0.00	0.00	15.00	144.00

G - BOARD - TNP2AA142/TNP2AA141

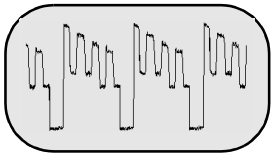
IC4904	
1	1.50
2	1.50
3	0.30
4	0.30
5	-14.60
6	2.70
7	2.70
8	2.70
9	2.70
10	15.10

IC4905			
1	4.50	10	2.60
2	4.50	11	2.90
3	4.50	12	8.90
4	1.50	13	4.50
5	4.50	14	4.50
6	1.40	15	4.50
7	0.00	16	4.50
8	4.80	17	4.50
9	0.00	18	4.50

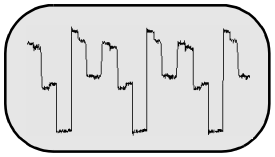
IC4907	
1	5.50
2	5.50
3	3.70
4	3.70
5	0.00
6	2.80
7	2.80
8	5.60
9	5.60
10	15.00

	Q4901
B	4.40
C	5.20
E	3.80

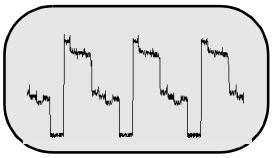
A-Board TNP2AH052NIL/AA



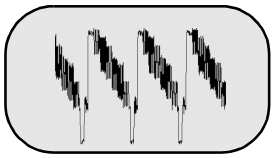
① **3.5 Vp-p**
A14 PIN 5 (BLUE OUT)



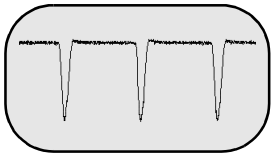
② **3.8 Vp-p**
A14 PIN 3 (RED OUT)



③ **3.2 Vp-p**
A14 PIN 4 (GREEN OUT)

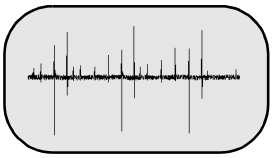


④ **1.0 Vp-p**
TPA1 (VIDEO)

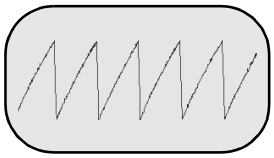


⑤ **3.24 Vp-p**
IC001 PIN 36 (FBP IN)

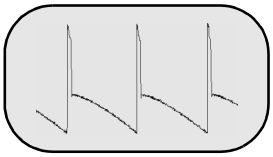
⑥
IC001 PIN 50 (OSC)



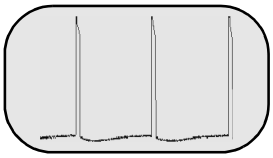
⑦ **544mv Vp-p**
IC451 PIN 7 (VERT IN)



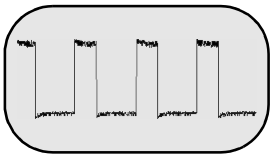
⑧ **1.10 Vp-p**
Q401 B (V DRIVE)



⑨ **58.0 Vp-p**
IC451 PIN 5 (V OUT)

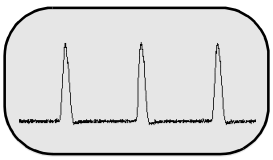


⑩ **30.4 Vp-p**
IC451 PIN 3 (PUMP UP)

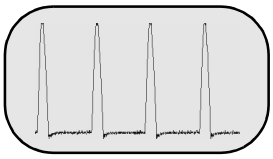


⑪ **0.9 Vp-p**
Q503 Base (H-DRIVE)

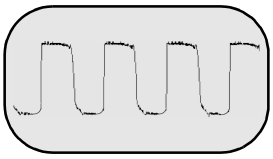
D-Board TNP2AH053NIL/AB



① **23.6 Vp-p**
D1 PIN 5 (HEATER)



② **.508 KVp-p**
Q551Collector (H OUT)



③ **218 Vp-p**
Q501 Collector